# COLOR LASER COPIER

# SERVICE MANUAL

REVISION 2 NOV. 1996

Canon
FY8-13D5-020

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# I. FEATURES

1. New engine and new image processing systems promise high-quality images and faithful reproduction of colors.

The use of a large-diameter drum and a fixed development method, new image processing technology, new transfer method, and a microscopic laser beam bring about stable image quality and accurate reproduction of colors.

2. Ease of operation on a large-sized liquid crystal display panel.

A full body of know-how on how to create full-color copies is ready at hand on a large-size liquid crystal display panel so that the operator can expect to obtain high-quality images regardless of his/her knowledge or skill in color reproduction.

3. Automatic duplexing mechanism.

The CLC800 is equipped with an automatic duplexing mechanism. (Thick paper may be used for two-sided copies by feeding it through the multifeeder; in the case of the CLC700, two-sided copies may be made in the manual mode.)

4. A variety of creative functions.

The copier provides a variety of features for those with a creative mind: its color creation mechanisms include fine-adjustment of hues, chroma, and density, adjustment of color balance; in addition, the copier offers a number of one-touch adjustment controls; its image creation mechanisms include texture processing, image repeating, and mirror imaging; its image processing/editing mechanisms include highlight processing, character processing, and coloring.

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# II. SPECIFICATIONS

## A. Type

| | |
|---|---|
| Body | Console |
| Copyboard | Fixed |
| Light source | Halogen lamp (235 W) |
| Lens | Lens array |
| Image reading | Photocells (BGR 3-line CCD); with CCD fixed, by mirror scanning |
| Photosensitive medium | OPC drum |

## B. System

| | |
|---|---|
| Reproduction | Laser beam indirect electrostatic reproduction |
| Charging | Corona |
| Exposure | Laser beam |
| Contrast adjustment | Automatic |
| Development | Projection and brush (M, C, Y, Bk) |
| Toner supply | Manual (345 g/bottle) |
| Pick-up | 2 special front loading cassettes and multifeeder (CLC700);<br>3 special front loading cassettes and multifeeder (CLC800) |
| Retention | Static retention (gripperless) |
| Transfer | Brush (transfer sheet) |
| Separation | Claw and push-up spacer (separation corona assembly as auxiliary) |
| Cleaning | Blade |
| Fixing | Heat roller (U, 600 W; L; 600 W) |


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## C. Performance

| | | | |
|---|---|---|---|
| Type of original | | Sheet, book, 3-D object (2 kg/4.4 lb max.) | |
| Maximum original size | | A3 (297 x 420 mm)/Ledger (11" x 17") | |
| Reproduction ratio | | Default: DIRECT (±0.5%), others (±1.0%; see Table 1-1)<br>Zoom: 25% to 400% (±1.0%) | |
| Wait time (20°C/68°F) | | 8 min (approx.)<br>3 min (approx.; in pre-heat mode) | |
| First copy time (A4/LTR) | | Without original detection scanning | 28 sec (approx.; full color) |
| Continuous copying | | 100 copies (max.) | |
| Copying speed | | See Table 1-2. | |
| Copy size | Cassette | Max.: A3 (297 x 420 mm)/Ledger (11" x 17")<br>Min.: B5R (182 x 257 mm)/LetterR (8.5" x 11") | |
| | Multifeeder | Max.: 297 x 432 mm (11.7" x 17")<br>Min.: 182 x 257 mm (7.16" x 10.11") | |
| Type of copy paper | Cassette | Plain paper (80 to 105 g/m$^2$), transparency (special) | |
| | Multifeeder | Postcard (special), thick paper (106 to 163 g/m$^2$), label sheet (special) | |
| | Two-sided copy (CLC800 only) | Plain paper (90 to 105 g/m$^2$) | |
| Cassette | | Clawless, center reference; 55 mm/2.17 in deep (about 500 sheets of 80 g/m$^2$ paper) | |
| Delivery tray | | 100 sheets (approx. of 80 g/m$^2$ paper) | |
| Copy margin | | One-sided | Two sided |
| | | Leading edge: 8.0 ± 1.5 mm<br>Trailing edge: 2.5 ± 1.5 mm<br>Left/right: 2.0 ± 1.0 mm | 8.0 ± 2.0 mm<br>2.5 ± 1.5 mm<br>2.0 ± 1.5 mm<br>(4.5 ±1.5 mm for one side of a two-sided copy or in manual mode) |
| Non-image width | | Leading edge: 8.0 ± 1.5 mm<br>Trailing edge: 4.5 mm<br>Left/right: 2.0 ± 1.0 mm | 8.0 ± 2.0 mm<br>4.5 mm<br>2.0 ± 1.5 mm |
| Main scanning direction | | 400 DPI (dots per inch; 15.7 dots/mm) | |
| Sub scanning direction | | 400 LPI (lines/in; 15.7 lines/mm) | |
| Auto clear | | Provided (2 min standard; may be changed or disabled in user mode) | |

| | |
|---|---|
| Auto color selection | Provided (distinguishes between color and black-and-white originals to select 4-color/black-mono copying) |
| AE | Provided |
| Auto paper selection | Provided |
| Auto zoom | Provided |
| One-touch adjustment | Provided |
| Color adjustment | Provided (color balance, chroma adjustment, hue adjustment) |
| Auto shutoff | Provided |
| Marker designation | Provided (requires IP-ED Board) |
| Original mode | Provided (text/photo, text, photo, map) |
| Frame erasing | Provided |
| Auto gradation correction | Provided |
| Option | Film Projector, CCV, IPU-2, IPU10/10S*, IPU II, PS-IPU, PS-IPU III, Film Scanner-3, RDF, Sorter |

* Connection requires replacement of the IPU10/10S's ROM, making it a CLC700/800-specific IPU10/10S.


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## D. Others

<table>
<tr><td>Operating environment</td><td colspan="3">Temperature: See Figure 5-1.<br>Humidity: See Figure 5-1.<br>Atmospheric pressure: 0.8 to 1 atm; 810.6 hPa to 1013.3 hPa)</td></tr>
<tr><td>Power supply (voltage ±10%)</td><td colspan="3"><table>
<tr><td>Model</td><td colspan="2">CLC700</td><td colspan="2">CLC800</td></tr>
<tr><td>TYPE</td><td>TYPE1</td><td>TYPE2</td><td>TYPE1</td><td>TYPE2</td></tr>
<tr><td>115V (TWN)</td><td>NCN xxxx</td><td>NKN xxxx</td><td>NCT xxxx</td><td>NKT xxxx</td></tr>
<tr><td>115V (USA)</td><td>NCL xxxx</td><td>NKL xxxx</td><td>NCS xxxx</td><td>NKS xxxx</td></tr>
<tr><td>230V (KOR)</td><td>———</td><td>PKR xxxx</td><td>———</td><td>———</td></tr>
<tr><td>230V (Others)</td><td>PCN xxxx</td><td>PKN xxxx</td><td>PCS xxxx</td><td>PKS xxxx</td></tr>
<tr><td>230V (UK)</td><td>QCQ xxxx</td><td>QKQ xxxx</td><td>QCS xxxx</td><td>QKS xxxx</td></tr>
<tr><td>230V (CA)</td><td>RCQ xxxx</td><td>RKQ xxxx</td><td>RCS xxxx</td><td>RKS xxxx</td></tr>
<tr><td>230V (FRN)</td><td>SCR xxxx</td><td>SKR xxxx</td><td>SCS xxxx</td><td>SKS xxxx</td></tr>
<tr><td>230V (GER)</td><td>TCR xxxx</td><td>TKR xxxx</td><td>TCS xxxx</td><td>TKS xxxx</td></tr>
<tr><td>230V (AMS)</td><td>UCR xxxx</td><td>UKR xxxx</td><td>UCS xxxx</td><td>UKS xxxx</td></tr>
</table>
TYPE1 and TYPE2 models may be identified by machine serial numbers.</td></tr>
<tr><td>Power consumption</td><td colspan="3">Maximum: 1.5 kW or less<br>Copying: 0.75 kW/h or less (A4, full-color, continuous; reference only)<br>Standby: 0.29 kW/h (pre-heat off; reference only)</td></tr>
<tr><td>Noise</td><td colspan="2">71 dB (copying)<br>50 dB (standby)<br>Measured at a point 1 m from the machine.</td><td>Sound power level as measured by the ISO method</td></tr>
<tr><td>Ozone</td><td colspan="3">0.02 ppm or less (average over 8 hr)</td></tr>
<tr><td>Consumables</td><td>Paper</td><td colspan="2">Keep paper wrapped to protect against humidity.</td></tr>
<tr><td></td><td>Toner</td><td colspan="2">Protect from sunshine; keep at 40°C/105°F or less.</td></tr>
<tr><td>Dimensions</td><td colspan="3">Width: 755 mm/29.7 in.<br>Depth: 770 mm/30.3 in.<br>Height: 1000 mm/39.4 in.</td></tr>
<tr><td>Weight</td><td colspan="3">253 kg (CLC700 only)<br>281 kg (CLC800 only)<br>3.7 kg (copyboard cover)<br>4.9 kg (editor)</td></tr>
</table>

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| Country | Reduction | | Enlargement | |
|---|---|---|---|---|
| Japan, Australia, others (6R5E) | | 0.250 | B4 → A3<br>B5R → A4R<br>B5 → A4 | 1.153 |
| | A3 → A4R<br>B4 → B5R | 0.707 | | |
| | B4 → A4R | 0.815 | A4R → B4, A5 → B5 | 1.223 |
| | A3 → B4<br>A4R → B5R | 0.865 | A4R → A3<br>B5R → B4 | 1.414 |
| | | 0.500 | A5 → A3 | 2.000 |
| | A3 → B5 | 0.611 | | 4.000 |
| North America (5R4E) | | 0.250 | LGL → 11" x 17" | 1.214 |
| | | 0.500 | LTRR → 11" x 17" | 1.294 |
| | 11" x 17" → LTRR | 0.647 | MINIT → LTRR | 2.000 |
| | 11" x 17" → LGL | 0.733 | MINIR → 11" x 17" | 4.000 |
| | LGL → LTRR | 0.786 | | |
| Europe (3R3E) | | 0.250 | A4R → A3 | 1.414 |
| | A3 → A4R | 0.707 | A5 → A3 | 2.000 |
| | | 0.500 | | 4.000 |

**Table 1-201 Default Reproduction Ratios**


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| Copy size | 4-color (YMCBk) | Mono-color (YMCBk) |
|---|---|---|
| A3 | 3.53 | 14.11 |
| B4 | 3.53 | 14.11 |
| A4-R | 3.53 | 14.11 |
| B5-R | 3.53 | 14.11 |
| A4 | 7.06 | 28.22 |
| B5 | 7.06 | 28.22 |
| 11" x 17" | 3.53 | 14.11 |
| LGL | 3.53 | 14.11 |
| LTR-R | 3.53 | 14.11 |
| LTR | 7.06 | 28.22 |

**Table 1-202 Copying Speed (copies/min)**

Specifications subject to change without notice.

**NOTICE:**
This copier is equipped with a Counterfeit Protection System.

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# III. ⚠LASER AND SAFETY MEASURES

## A. DHHS

The CLC700/800 has been approved as Class 1 equipment under the Radiation Performance Standards of the Department of Health and Human Services (DHHS), established in the U.S.A. in 1968.

The approval represents that the product has shown to be free of harmful laser beams; the optical system of the product is designed such that the laser beams are confined in a protective housing and cannot escape the product while in use.

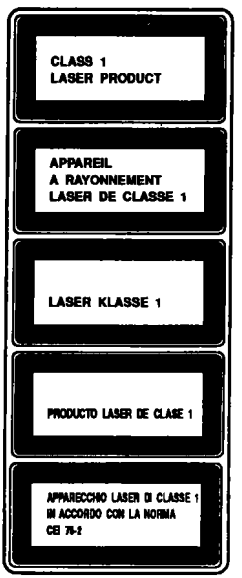


Figure 1-1

## B. CDRH

On August 2, 1976, the Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration of the U.S.A. put an act in force to deal with laser devices.

Under the act, laser devices manufactured on and after August 1, 1976, may not be marketed in the United States without approval.

Figure 1-2 shows the label which serves as proof of approval under the act; the label is required to be attached to all laser devices marketed in the U.S.A.

CANON
30-2, SHIMOMARUKO, 3-CHOME, OHTAKU, TOKYO, 146, JAPAN.
MANUFACTURED :
THIS PRODUCT CONFORMS WITH CDRH RADIATION PERFORMANCE STANDARD 21CFR CHAPTER 1 SUBCHAPTER J.

Figure 1-2

**Note:**
The description may vary from product to product.


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## C. Points to Note When Handling the Laser Unit

When servicing the optical unit of the product, take adequate care not to interrupt the laser path with a tool having a high reflectance.

As a rule, remove the watch, rings, or the like before work; such items tend to reflect the beam and damage the eyes.

Remain alert when servicing inside the covers on which the label is attached.

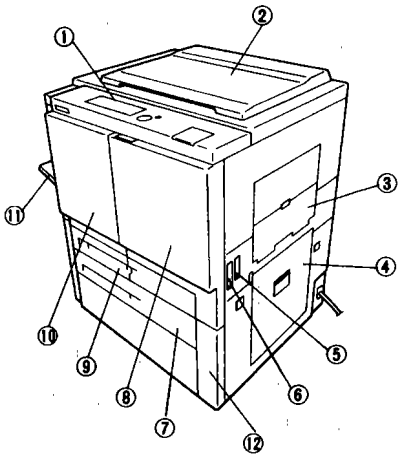
The machine is equipped with a shutter which blocks out the laser beam when the front left door is opened; therefore, when images are checked with the front left door open, the shutter needs to be held open using a door switch actuator. Keep these in mind when such work is necessary.

FS5-8834
CAUTION - LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ATTENTION - RAYONNEMENT LASER EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
VORSICHT - LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
PRECAUCION - RADIACION LASER CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.
ATTENZIONE - RADIAZIONE LASER IN CASO DI APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.
VARO! - AVATTAESSA OLET ALTTINA LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING! - LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
ADVARSEL! - LASER STRÅLING, NÅR DENNE ER ÅBEN. UNDGÅ BESTRÅLING.
ADVARSEL - LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.

Figure 1-3

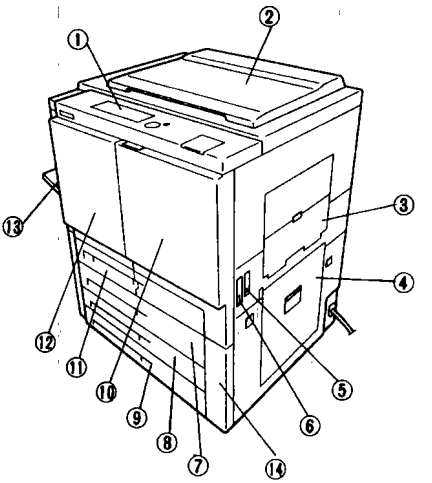
# IV. NAMES OF PARTS

## A. External View




① Control panel
② Copyboard cover
③ Multifeeder
④ Pick-up door
⑤ Control key
⑥ Power switch
⑦ Cassette 2
⑧ Front right door
⑨ Cassette 1
⑩ Front left door
⑪ Copy tray
⑫ Servicing documents compartment

**Figure 1-4 (CLC700)**




① Control panel
② Editor
③ Multifeeder
④ Pick-up door
⑤ Control key
⑥ Power switch
⑦ Duplexing unit
⑧ Cassette 3
⑨ Cassette 4
⑩ Front right door
⑪ Cassette 1
⑫ Front left door
⑬ Copy tray
⑭ Servicing documents compartment

**Figure 1-5 (CLC800)**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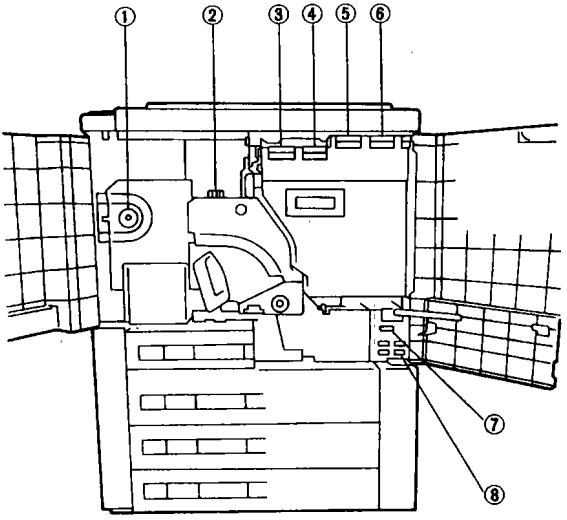


① Fixing assembly knob
② Front left door switch
③ Bk toner supply mouth
④ M toner supply mouth
⑤ C toner supply mouth
⑥ Y toner supply mouth
⑦ Front right door switch
⑧ Counter

**Figure 1-6 (CLC800)**

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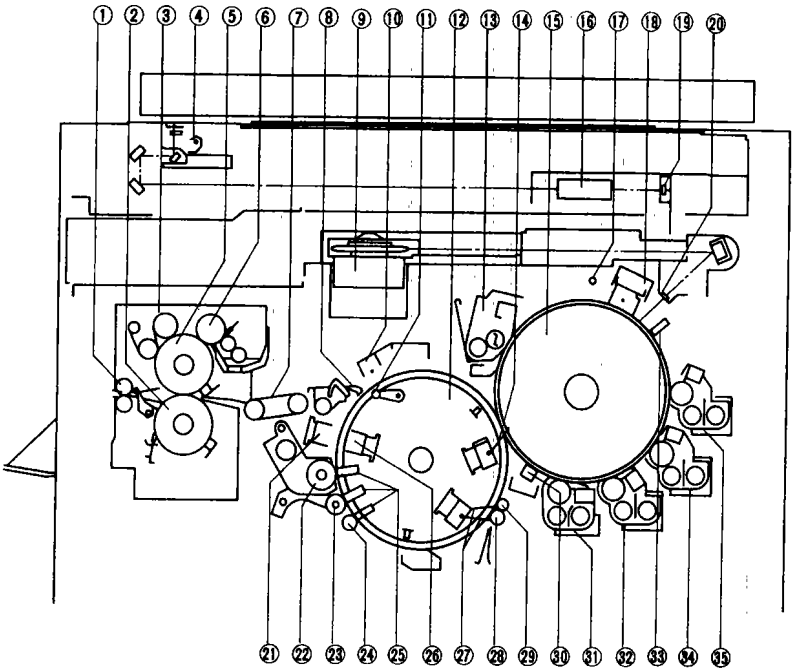
## B. Cross Section



① Inside delivery roller
② Lower fixing roller
③ Cleaning belt
④ Scanning lamp
⑤ Upper fixing roller
⑥ Oil application roller
⑦ Feed belt
⑧ Separation claw
⑨ Laser scanner
⑩ Separation corona assembly
⑪ Separation push-up spacer
⑫ Transfer drum
⑬ Photosensitive drum cleaner
⑭ Transfer brush
⑮ Photosensitive drum
⑯ Lens
⑰ Pre-exposure lamp
⑱ Primary corona assembly
⑲ CCD
⑳ Dust proof glass
㉑ External static eliminator
㉒ Transfer drum cleaner
㉓ Transfer oil removing roller
㉔ Transfer polishing roller
㉕ Transfer push-on brush
㉖ Internal static eliminator
㉗ Retention brush
㉘ Retention roller
㉙ Retention smoothing roller
㉚ Black toner density sensor
㉛ Black developing assembly
㉜ Magenta developing assembly
㉝ Potential sensor
㉞ Cyan developing assembly
㉟ Yellow developing assembly

**Figure 1-7 (CLC700/CLC800)**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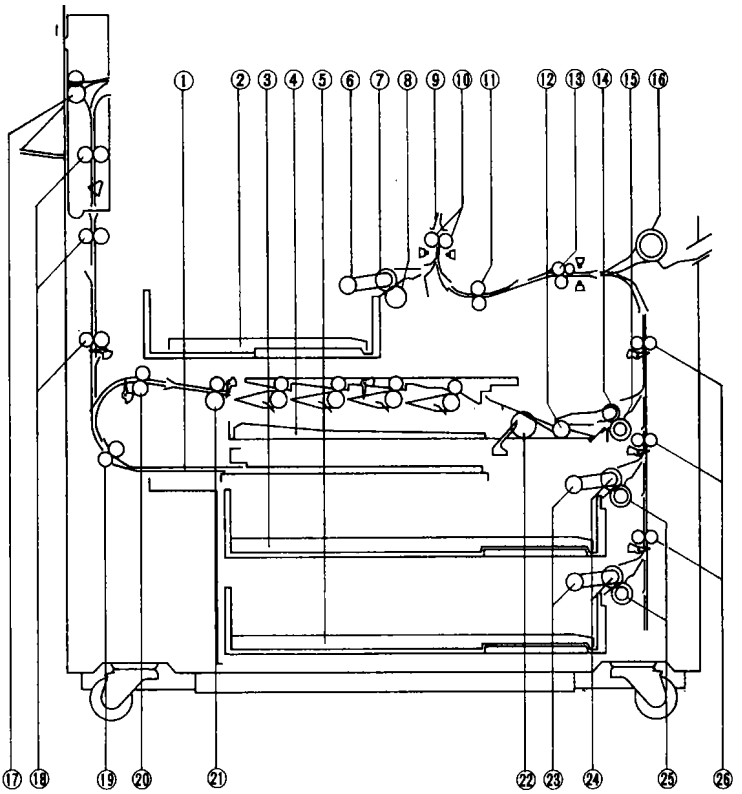


① Duplexing unit reversing assembly
② 1st cassette holder
③ 2nd cassette holder
④ Duplexing stacking assembly
⑤ 4th cassette holder
⑥ Cassette 1 pick-up roller
⑦ Cassette 1 feeding roller
⑧ Cassette 1 separation roller
⑨ Retention guide
⑩ Registration roller
⑪ Pre-registration roller 1
⑫ Duplexing pick-up roller
⑬ Pre-registration roller 2
⑭ Duplexing feeding roller
⑮ Duplexing separation roller
⑯ Multifeeder pick-up roller
⑰ External delivery roller
⑱ Delivery vertical path roller
⑲ Duplexing reversing assembly inlet roller
⑳ Duplexing reversing assembly feeding roller
㉑ Duplexing reversing assembly outlet roller
㉒ Duplexing unit feeding roller
㉓ Cassette 3/4 pick-up roller
㉔ Cassette 3/4 feeding roller
㉕ Cassette 3/4 separation roller
㉕ Cassette 3/4 separation roller
㉖ Pick-up vertical path roller

**Figure 1-8 (CLC800)**

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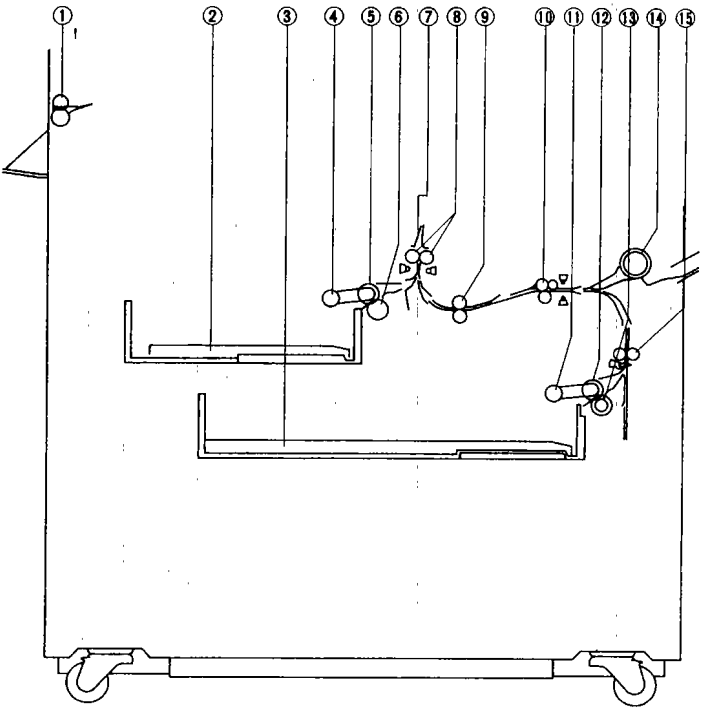


① External delivery roller
② 1st cassette holder
③ 2nd cassette holder
④ Cassette 1 pick-up roller
⑤ Cassette 1 feeding roller
⑥ Cassette 1 separation roller
⑦ Retention guide
⑧ Registration roller
⑨ Pre-registration roller 1
⑩ Pre-registration roller 2
⑪ Cassette 2 pick-up roller
⑫ Cassette 2 feeding roller
⑬ Cassette 2 separation roller
⑭ Multifeeder pick-up roller
⑮ Pick-up vertical path roller

**Figure 1-9 (CLC700)**


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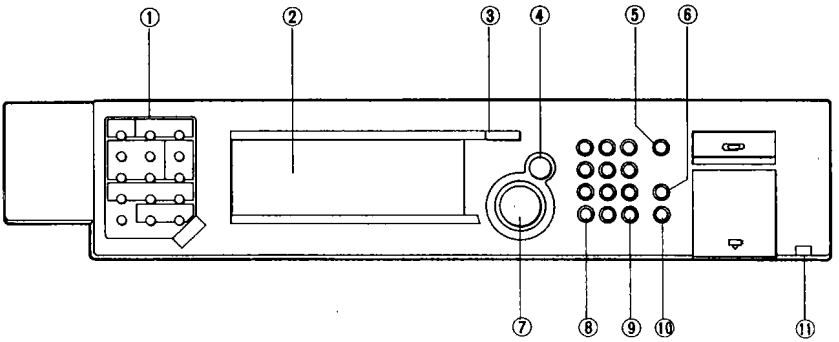


**Figure 1-10**

| Key | Operation/function | Remarks |
|---|---|---|
| ① Extended Copy Mode key | Press it when selecting a copy mode. | |
| ② Message display key | Press it to display the current copy mode and settings. | |
| ③ Reset key | Press it to cancel the current copy mode and return to standard mode. | |
| ④ Stop key | Press it to stop continuous copying. | |
| ⑤ Pre-Heat key | Press it to start or end pre-heat mode. | |
| ⑥ Interrupt key | Press it to interrupt the ongoing copying run for making an extra copy. | |
| ⑦ Start key | Press it to start copying operation. | |
| ⑧ Clear key | Press it to change the copy count or settings. | |
| ⑨ ID key | Press it to activate ID mode. | A press activates ID mode, requiring input of an ID for the next copy. |
| ⑩ Call key | Press it to recall any of the most recent three copy modes. | |
| ⑪ Pilot lamp | Comes on (green) when the power is switched on. | |

**Table 1-301**

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## Instructions to the User

1. You must use manual mode when making two-sided copies (CLC700) or on thick paper (CLC700/800); be sure to reverse the curl on the leading edge of the paper before feeding it for the second time.
2. When stacking transparencies in the cassette, be sure to place paper (thick, for backing) on the bottom of the stack.
3. When stacking transparencies in the cassette or the multifeeder, be sure to separate, as by fanning out, the transparencies before placing the stack.
4. Keep in mind that copy paper may be classified into the following five:

| | |
|---|---|
| plain paper: | regular copy paper (80 to 105 g/m$^2$) |
| thick paper: | copy paper with certain thickness (106 to 157 g/m$^2$) |
| transparency: | transparent film used for OHP |
| special 1: | paper identified by the Special 1 notation on the wrappings |
| special 2: | paper identified by the Special 2 notation on the wrappings |


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# V. OPERATIONS

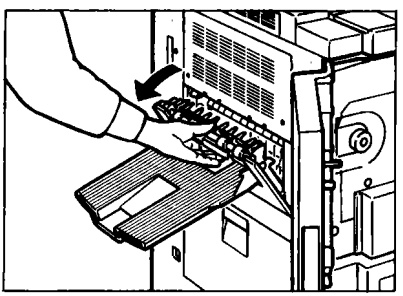
## A. Removing jams

If paper jams, remove it as follows:

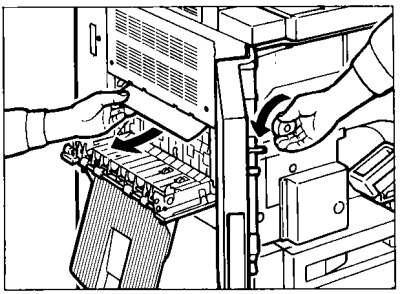
1) Open the front door (left/right).
2) Check all locations identified on the touch panel display, and remove the paper, if any.
3) Shift any levers or close any doors you have moved or opened back into position.
4) Open both left and right front doors once, and close them.

## B. Jam behind the Upper Left Door

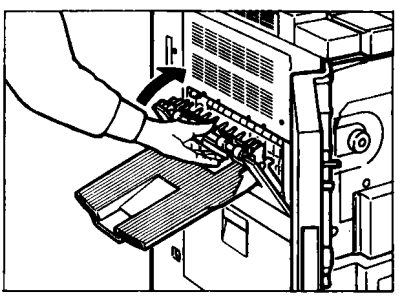
1) Open the front door (left/right).
2) Remove the copy paper from the tray.
   Then, hold the grip on the body, and slowly open the left door.



3) Turn the knob (green) counterclockwise, and remove the paper from the rear of the delivery assembly.



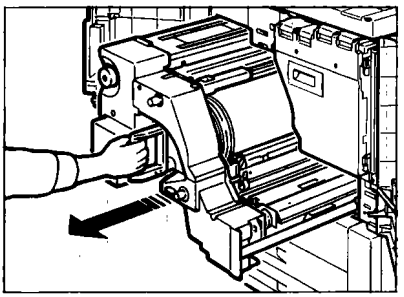
4) After removing the paper, close the left door securely.



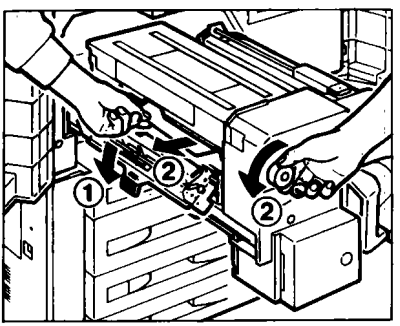
5) Close the front door.

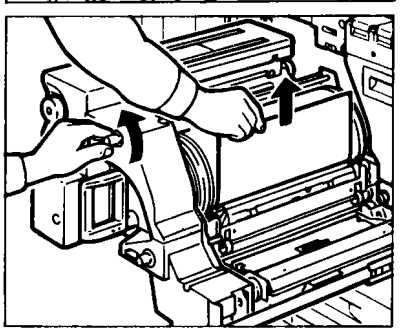
## C. Jam behind the Front Door

1) Open the front door (left/right).
2) Shift the lever (green) to the left, and pull it to draw out the transfer assembly frame.

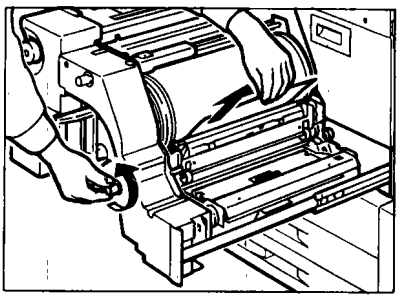


3) Turn the knob (green) counterclockwise, and remove the paper.

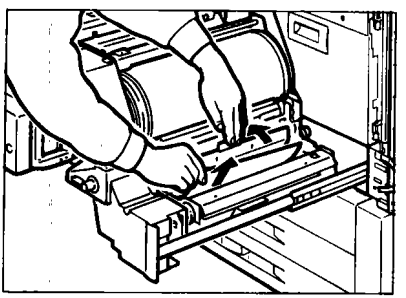


If the paper is trapped deep inside, turn the knob (green) counterclockwise to remove it.



4) Shift the knob (green) up and remove the paper.

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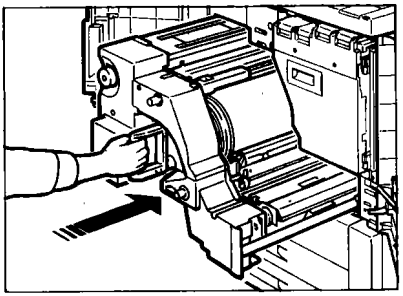
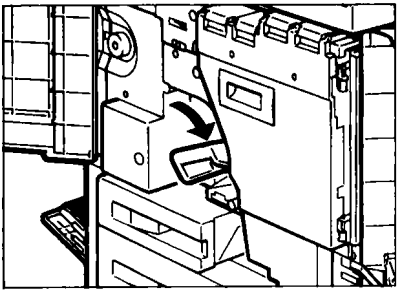
5) Push the transfer assembly frame into the copier, and put the lever (green) back into position.

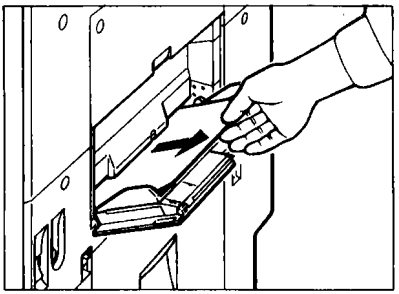




6) Close the front door (left/right).

## D. Paper in the Multifeeder Assembly

1) Remove the paper set in the multifeeder. Then, remove the paper jammed inside the multifeeder assembly.



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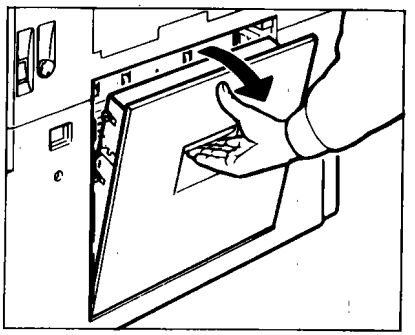
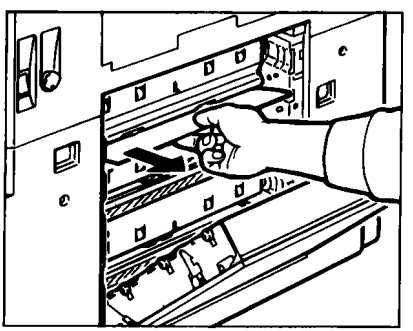
## E. Paper Behind the Lower Right Door

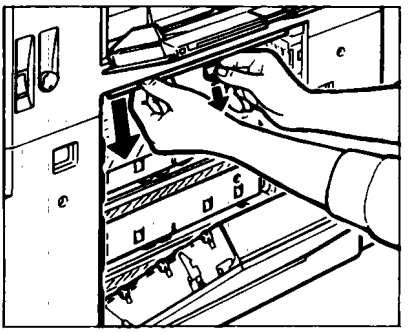
1) Open the right door of the cassette assembly.



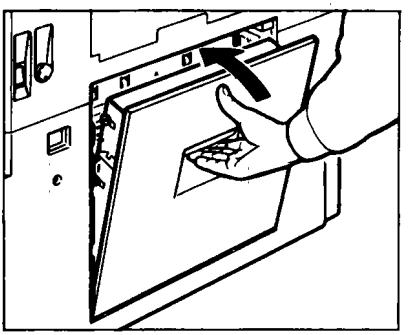
2) Remove the paper.



3) While pushing the grip (green) shown in the figure toward the lower rear, remove the paper.



4) Close the right door of the cassette assembly securely.

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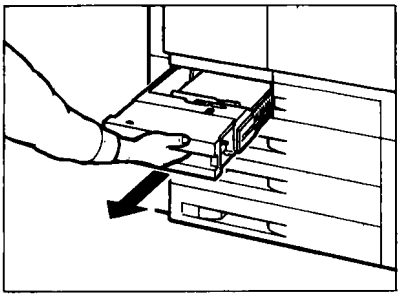
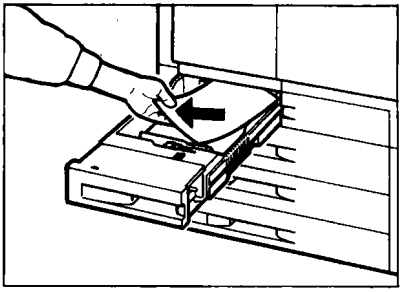
## F. Paper in the Cassette Assembly

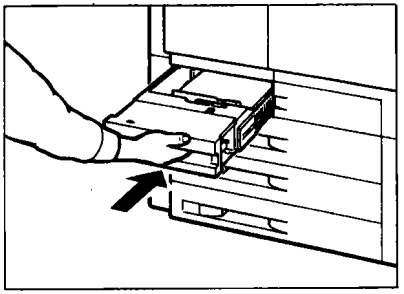
1) Draw out the cassette



2) Remove the paper jammed in the cassette.

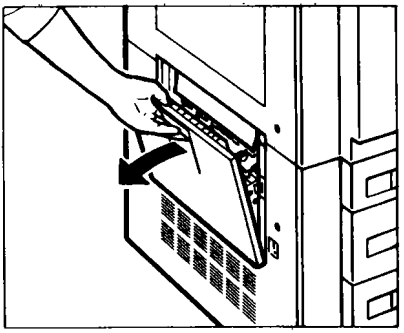


3) Put the cassette back into position.

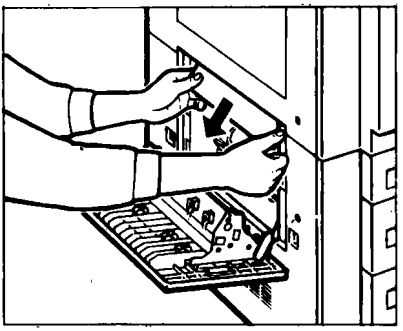


## G. Paper behind the Lower Left Door

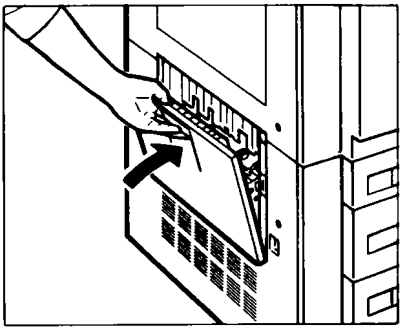
1) Open the lower left door.



2) Remove the paper.



3) Close the lower left door securely.



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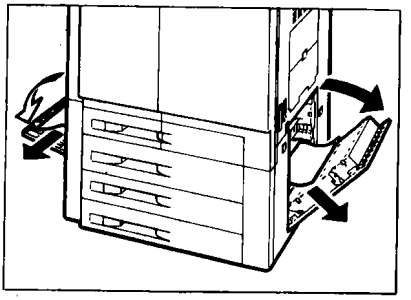
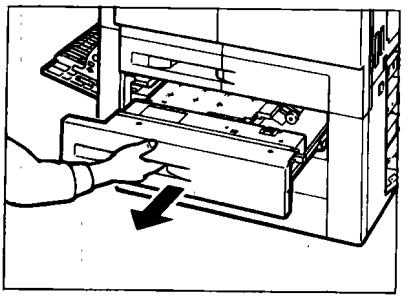
## H. Paper in the Duplexing Unit Assembly

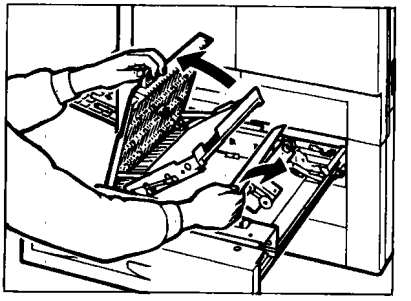
1) Open the bottom door (left/right), and remove any paper.



2) Draw out the duplexing unit.

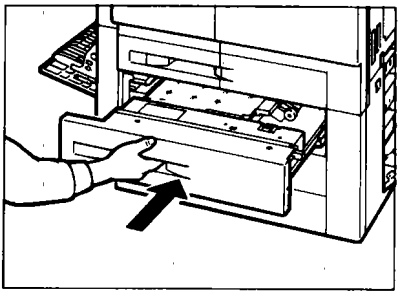


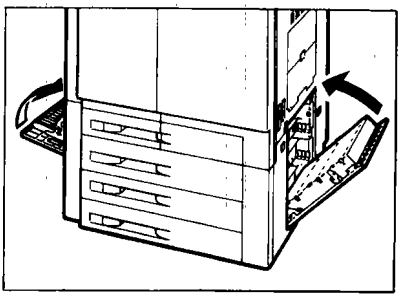
3) Open the cover shown in the figure, and remove the paper.



If any paper is half way out of the duplexing tray, remove it.

4) Put the duplexing tray back into position, and close the door of the vertical path unit (left/right) securely.



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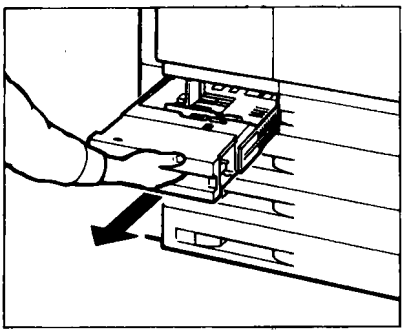
# I. Supplying Paper

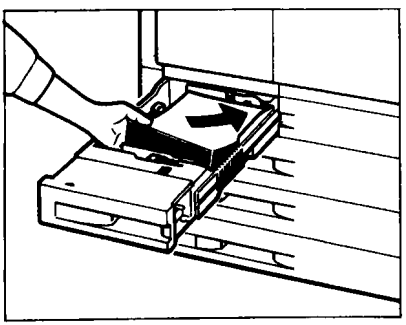
Check the display to find out which unit needs paper, and supply it with paper as follows:

1) Hold the grip on the cassette, and pull it to the front until it stops.



2) Unwrap the copy paper while keeping the following in mind:
   - Each cassette can hold 500 sheets (80 g/m$^2$) of copy paper.
   - Use paper of a type recommended by Canon for the best results.
   - Wrap any remaining paper, and keep it in a place protected from humidity and direct rays of the sun.
   - Do not use any of the following to avoid jams.
     - wrinkled paper, curled paper
     - thin, coarsely processed paper
   - For automatic two-sided copies, paper of 105 g/m$^2$ is recommended.

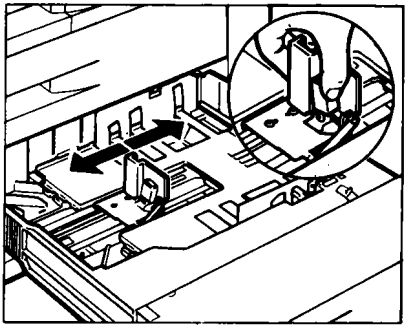
3) Put the stack of paper in the cassette. (Keep in mind that paper has face and back.)



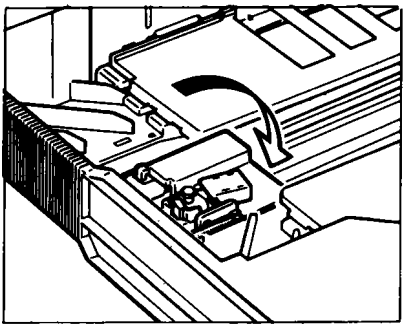
4) Hold the grip on the pick-up cassette, and push it inside the copier until a click is heard.

## J. Changing the Cassette Size

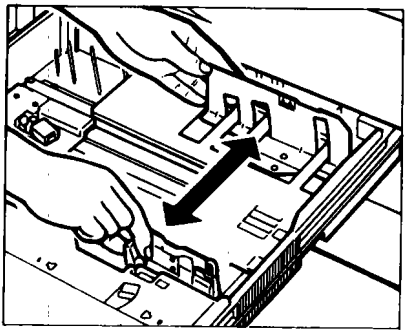
1) Hold the lever as shown in the figure, and slide the length guide to the appropriate length index.



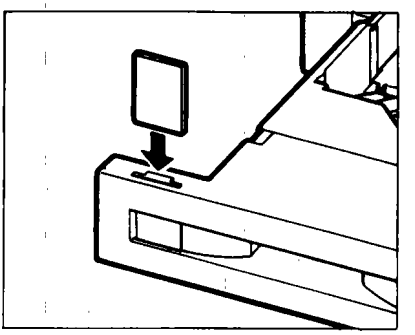
If you are cleaning the paper size to A3, slide the length guide to the left end and shift down the guide to the right.



2) Hold the lever as shown in the figure, and slide the width guide to the appropriate width index.



3) Replace the size plate of the cassette to suit the new paper size.

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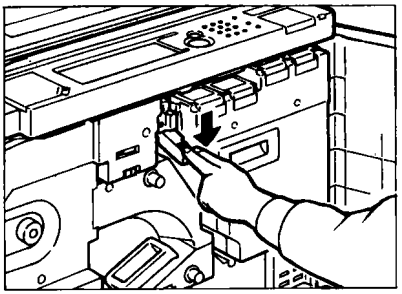
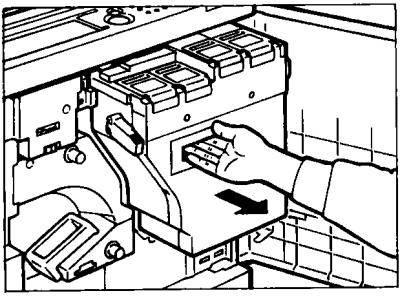
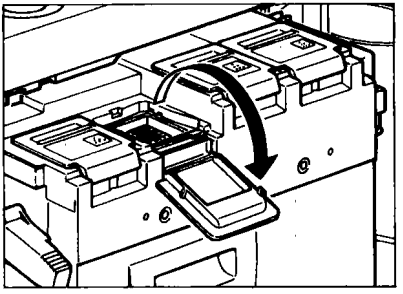
## K. Supplying Toner

1) Open the front door.
2) Push down the lever, and draw out the hopper unit.

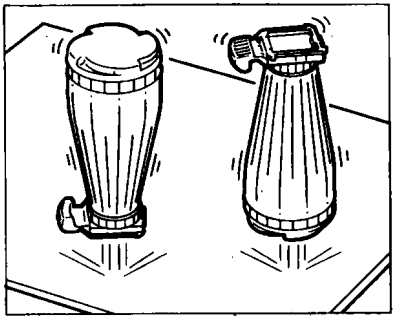




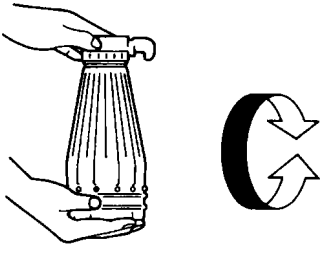
3) Open the lid on the toner supply mouth whose color is the same as the toner to be supplied.



4) While keeping its mouth at the bottom, drop the toner bottle about five times to a firm surface (desk) from a height of about 3 cm.
Then, turn over the toner bottle, and drop it about five times in the same way.



5) Hold the toner bottle with both hands, keep turning it upside down and back about 20 times.



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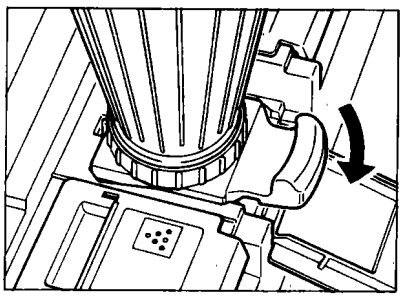
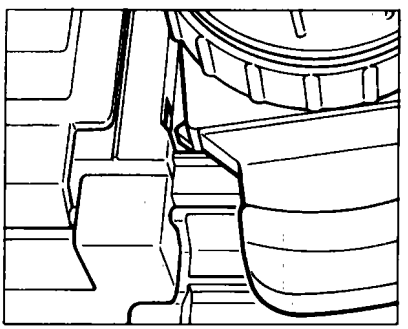
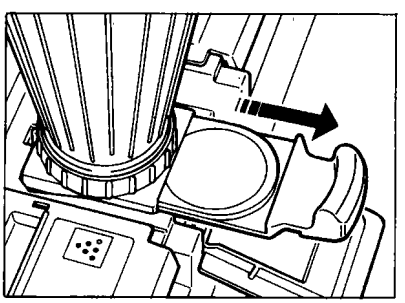
6) Fit the mouth of the toner bottle over the toner supply mouth, then turn the toner bottle clockwise until it is securely in place.

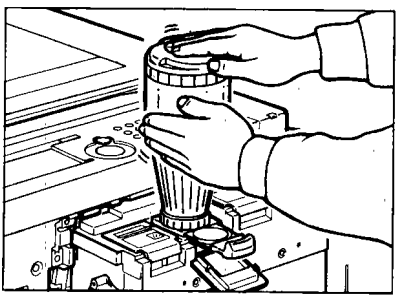
Check that the claw of the bottle is engaged with the supply mouth and the bottle is securely in place; then, pull the shutter.



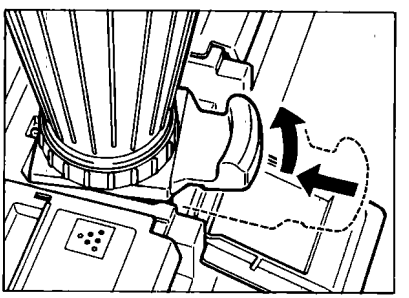




7) Lightly tap the bottom and sides of the toner bottle two to three times to make sure that all toner is out the bottle and in the hopper.



8) Close the shutter, and turn the toner bottle counterclockwise; then, lift the toner bottle slowly.



9) Close the lid of the supply mouth, and push the hopper unit back into position; then, close the front door.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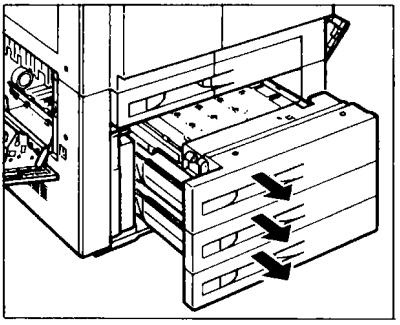
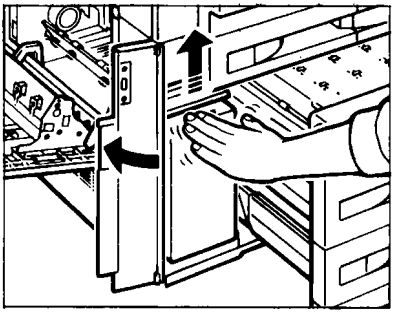
## L. Collecting Waste Toner

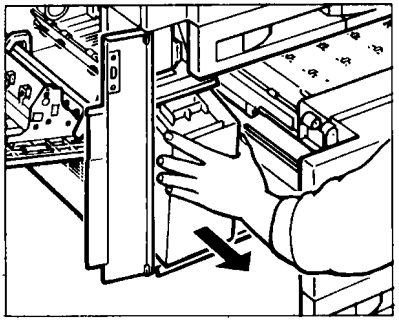
Replace the collection container with a new one as follows:

1) Open the bottom door (left/right)
2) Draw out the cassette and two-sided unit.

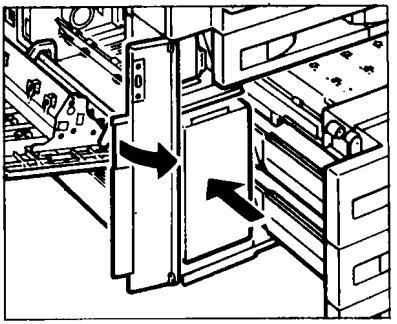


3) Open the cover in front of the waste toner container; then, while shifting up the lever, slide out the container that has become full with toner.





4) Set an empty waste toner collection container, and close the cover.



5) Put the cassette, duplexing unit, and lower door into original position.

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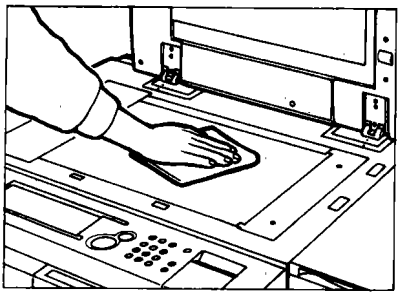
## M. Routine Maintenance

Advise the user to clean the following parts about once a week or when copies become soiled.

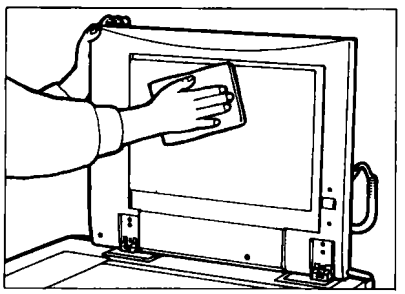
■ Copyboard Glass

Wipe the glass with a cloth moistened with water or mild detergent, and dry wipe it.



■ Copyboard Cover

Wipe the sheet with a cloth moistened with water or mild detergent, and dry wipe it.

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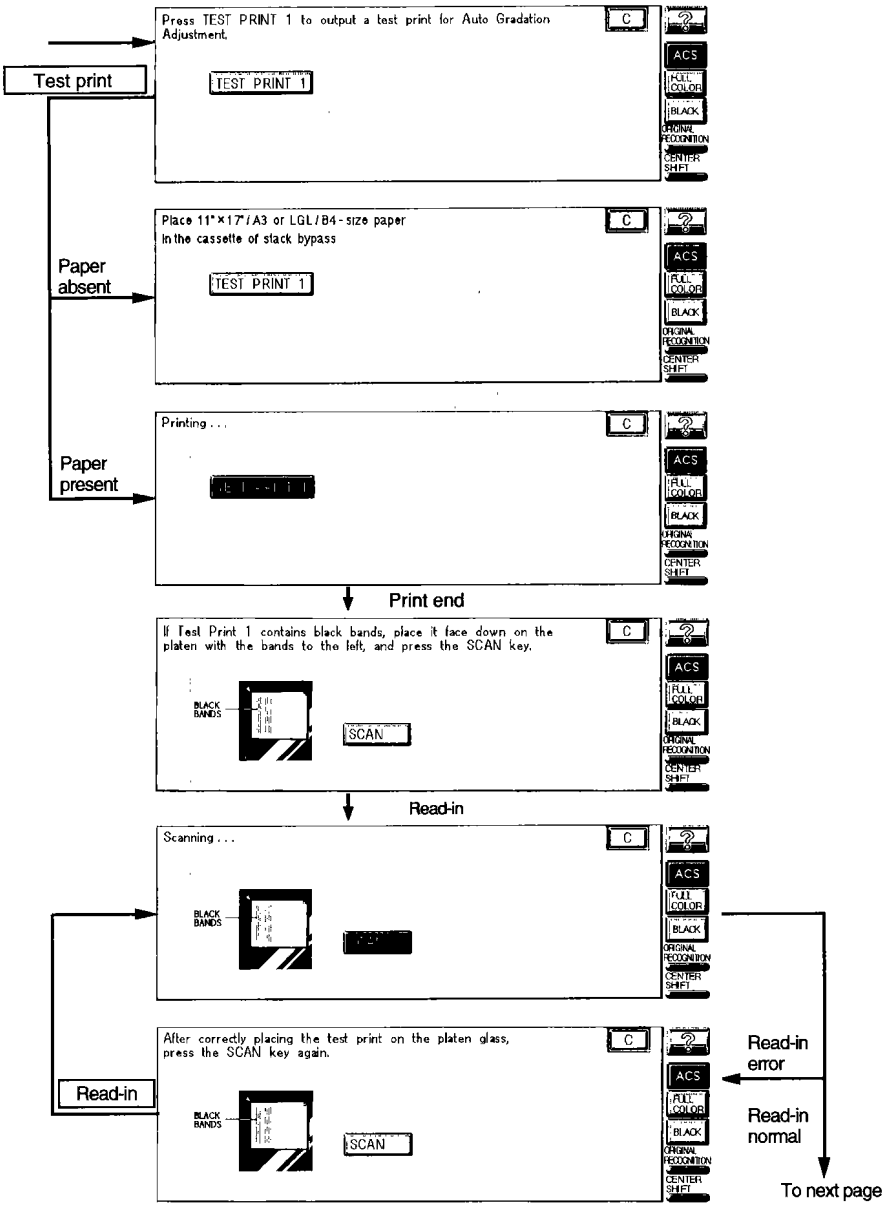
## N. Using Automatic Gradation Correction

Press the User mode ( * ) key, and select 'automatic gradation correction'; then, follow the following instructions.


Test print
Press TEST PRINT 1 to output a test print for Auto Gradation Adjustment.
TEST PRINT 1
Paper absent
Place 11"×17"/A3 or LGL/B4-size paper in the cassette of stack bypass
TEST PRINT 1
Paper present
Printing . . .
Print end
If Test Print 1 contains black bands, place it face down on the platen with the bands to the left, and press the SCAN key.
BLACK BANDS
SCAN
Read-in
Scanning . . .
BLACK BANDS
After correctly placing the test print on the platen glass, press the SCAN key again.
BLACK BANDS
SCAN
Read-in
Read-in error
Read-in normal
To next page
C
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT

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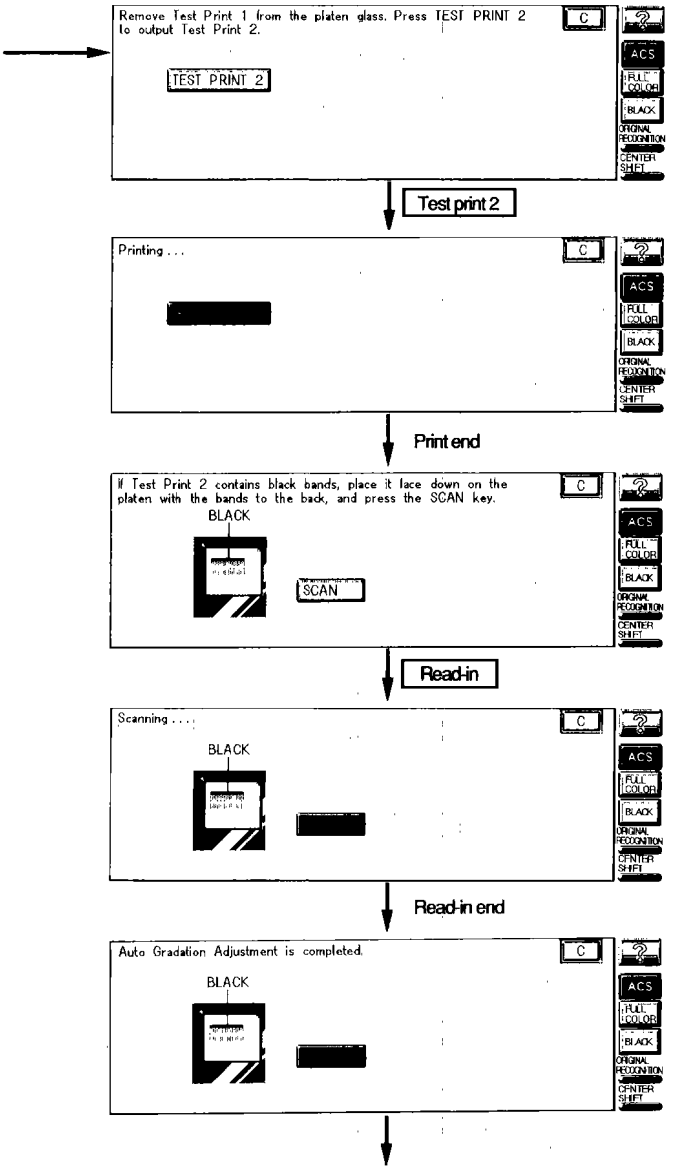
Remove Test Print 1 from the platen glass. Press TEST PRINT 2 to output Test Print 2.
TEST PRINT 2
Test print 2
Printing . . .
Print end
If Test Print 2 contains black bands, place it face down on the platen with the bands to the back, and press the SCAN key.
BLACK
SCAN
Read-in
Scanning . . .
BLACK
Read-in end
Auto Gradation Adjustment is completed.
BLACK
ACS
FULL COLOR
BLACK
ORIGINAL RECOGNITION
CENTER SHIFT

The User Mode screen returns to end the session.


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# I. IMAGE FORMATION

## A. Outline

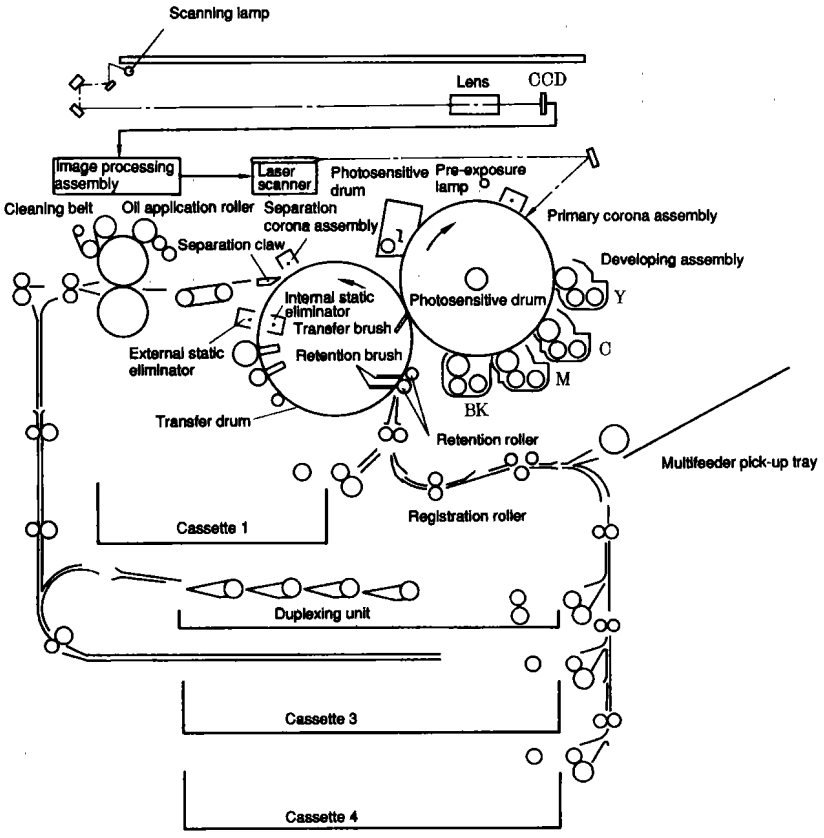


**Figure 2-1**

The copier uses a seamless drum as its photosensitive medium; see Figure 2-2 for its construction.

The photosensitive drum consists of a photo-conducting outside layer made of photo-conducting material (OPC) and an aluminum base on the inside.

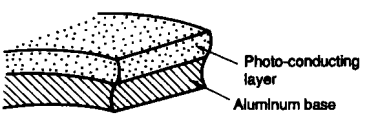


**Figure 2-2**

As opposed to black-and-white copiers, the copier may be characterized by the following:

The copier illuminates a color original, and separates the reflected light into the three primary colors of light by means of filters for identification by CCDs. Based on the data from the CCDs, a laser beam is directed on the photosensitive drum to develop the color* that corresponds to each filter. The process is repeated a maximum of four times, and the resulting image is fixed on paper to produce a color copy.

* Using toner which is complementary to the color of the filter.

The repetition of the process requires retention of copy paper, and a transfer drum is provided in addition to the photosensitive drum for this purpose.

The transfer drum is identical in size with the photosensitive drum; therefore, the photosensitive drum makes a single rotation for each rotation of the transfer drum.

The copier's image formation process can be divided into the following nine steps:

Step 1 Pre-exposure
Step 2 Primary charging (-)
Step 3 Laser exposure
Step 4 Development (AC + DC bias)
Step 5 Retention (-, +)
Step 6 Transfer (-, +)
Step 7 Separation (AC + DC)
Step 8 Photosensitive drum cleaning
Step 9 Fixing

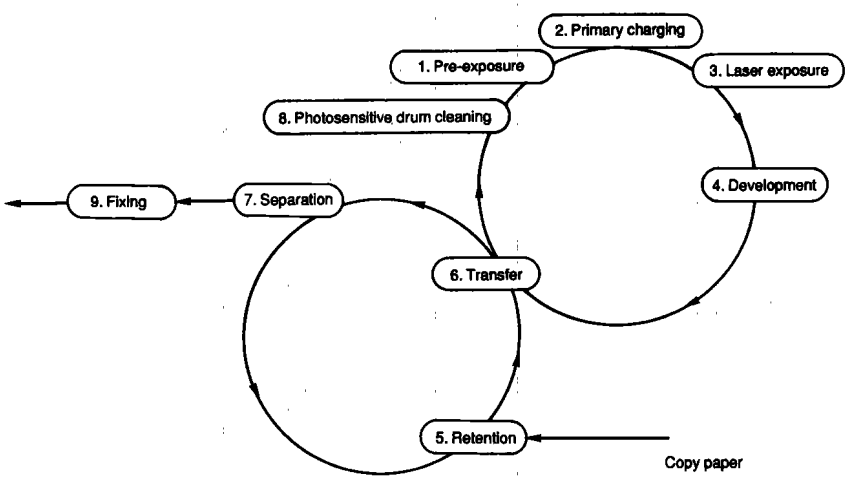


**Figure 2-3**


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## B. Latent Static Image Formation Block

This block consists of three steps, ultimately leaving negative charges in areas of the drum surfaces that represent the white areas of the original and removing negative charges from those areas that represent the black areas of the original.

The image on the drum surface created by the presence/absence of negative charges is not visible to the human eye and, is therefore, called the *latent static image*.

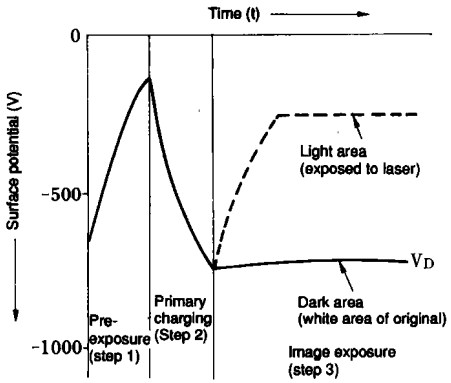


Figure 2-4

## C. Pre-Exposure (step 1)

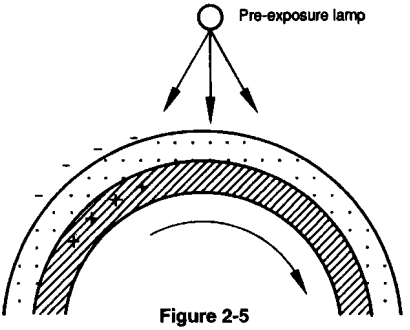


Figure 2-5

Before primary charging is executed, light from the pre-exposure lamp is directed to the drum surface to remove any residual charges from the drum surface, thereby preventing uneven copy density.

## D. Primary Charging (step 2)

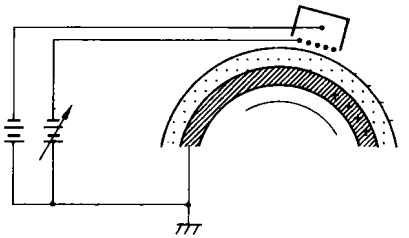

Figure 2-6

The primary corona assembly charges the drum surface with a uniform layer of negative charges to obtain primary potential.

The surface potential of the drum charged this way is determined by the potential of the grid; and, for this reason, a bias is applied to the grid to ensure a stable drum surface potential.

## E. Laser Exposure (step 3)

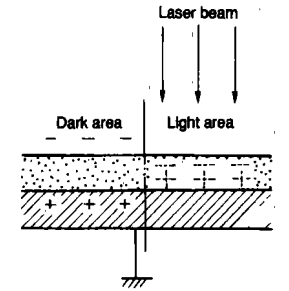


Figure 2-7

A laser beam is directed to the drum surface in such a way that will represent the dark areas of the original, thereby neutralizing the charges on the drum surface. Such areas are called the *light* areas of the photosensitive drum, and will attract toner in step 4 (development).


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## F. Development (step 4)

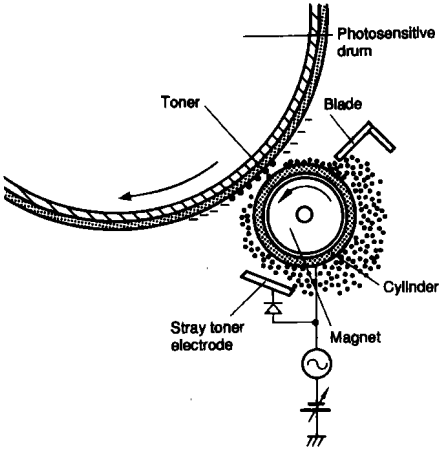


Figure 2-8

In this step, the latent static image on the drum surface is turned into a visible image.

In the case of the copier, the light areas of the drum, i.e., areas that have been exposed to the laser beam, will receive toner which is charged to a negative potential as in primary charging.

As shown in Figure 2-8, the developing assembly consists of a developing cylinder and a magnetic blade.

The developing cylinder, on the other hand, consists of a field magnet and a cylinder that revolves around it.

The developer is composed of toner (mainly of resins and dyes) and carrier (iron powder) mixed in a specific ratio. The toner and the carrier (iron powder) become charged through friction against each other so that the toner assumes a negative potential and the carrier, positive.

The developer is held inside the magnetic field of the fixed magnet as if to cling to the cylinder surface, and a blade is used to make sure that the toner is kept in a uniform layer.

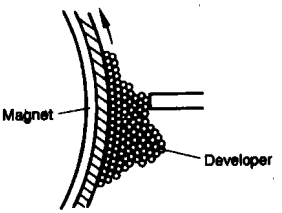


Figure 2-9

The developing cylinder is subjected to both double blanking pulses and DC bias (negative component) simultaneously for better developing efficiency and better reproduction of highlights; for this reason, the negative component of the developing bias is higher than the positive component.

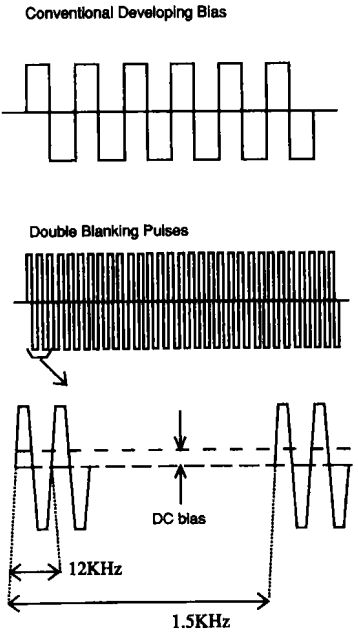


Figure 2-10

During copying operation, the toner is attracted to the light areas on the photosensitive drum by the work of the drum surface potential and the negative component of the developing bias, turning the latent static image on the drum into a visible image—any excess toner is drawn off the photosensitive drum by the work of the drum surface potential and the positive component of the developing bias.

A high voltage (negative) is applied to the electrode under the cylinder of the developing assembly to prevent toner from moving astray.

## G. Retention (step 5)

The copier's transfer drum does not have a gripper; instead, it uses a method in which paper is attracted from the registration roller to the transfer drum sheet by means of static electricity in a process called *retention*.

A retention brush and retention push-on roller are found where copy paper comes into contact with the transfer drum. The retention brush remains in contact with the inner side of the transfer drum sheet, and is supplied with negative charges which attract copy paper to the transfer drum sheet.

The smoothing brush and smoothing roller both serve to keep the charges on copy paper even.

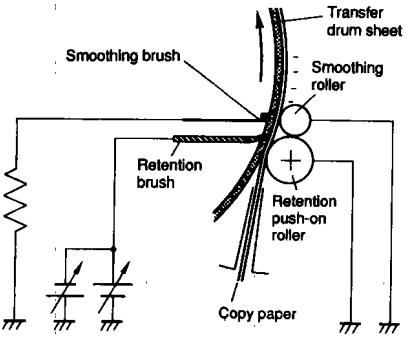


**Figure 2-11**


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## H. Transfer (step 6)

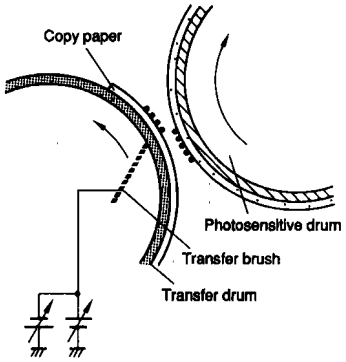


**Figure 2-12**

The toner on the photosensitive drum surface is transfered to copy paper by applying negative/positive charges to the back of copy paper (inner side of the transfer drum) where copy paper and photosensitive drum are in contact with each other.

## I. Separation (step 7)

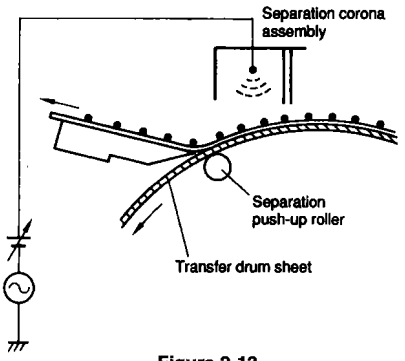


**Figure 2-13**

Copy paper is separated from the transfer drum using the separation claw and separation push-up roller. Since copy paper is held on the transfer drum by the work of static electricity, the separation corona assembly is used to apply an AC corona and DC bias to facilitate the separation of copy paper from the transfer drum.

## J. Photosensitive Drum Cleaning (step 8)

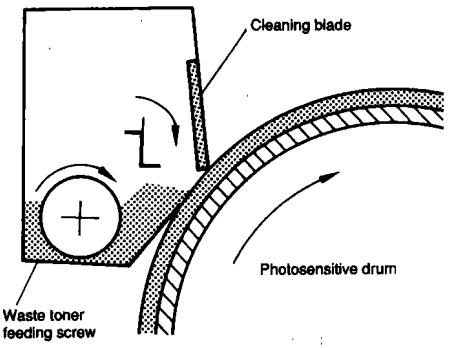


**Figure 2-14**

To prepare for the next copying cycle, the cleaning blade is used to scrape and collect the toner that remains on the drum surface.

The toner collected by the cleaning blade is moved toward the rear and through the back of the copier by the waste toner feeding screw for storage in the waste toner container.

## K. Fixing (step 9)

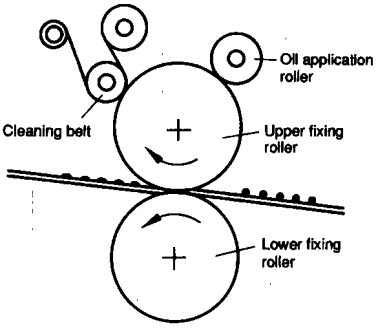


**Figure 2-15**

Copy paper for which transfer has been executed as much as four times is forwarded to the fixing assembly, where it is heated by two fixing rollers. During the process, the color toners representing four colors are melted and mixed to reproduce the intended colors and, at the same time, fixed to copy paper.

To prevent adhesion of toner from copy paper to the fixing roller (called offset), the roller surface is given amounts of silicone oil as necessary. Further, the fixing roller is kept clean by a cleaning belt and blade.


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# II. AUXILIARY PROCESS

## A. Static Eliminator

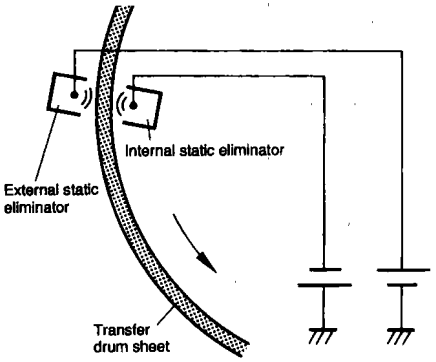


Figure 2-16

The charges applied to the transfer drum sheet after separation of copy paper are in any of four stages from negative to positive depending on the selected copy mode (1-color to 4-color), necessitating appropriate removal of these charges in preparation for the next retention of copy paper—in practice, negative charging is executed.

## B. Transfer Drum Cleaning

The copier is equipped with transfer cleaners 1, 2, and 3 to keep the transfer drum sheet clean.

The transfer cleaner is operated during post-copying rotation, the transfer cleaner 2 is operated during post rotation that follows the making of a two-sided copy, and the transfer cleaner 3 is operated during post rotation that follows the making of a specific number of copies.

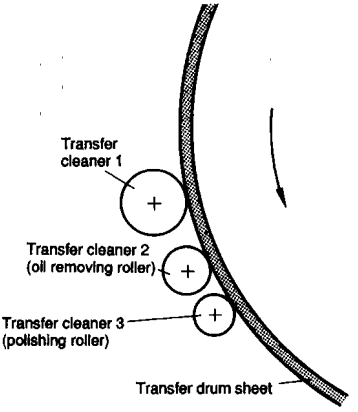


Figure 2-17

## C. Ozone Filter

The exhaust fan assembly is equipped with three catalytic filters to decompose the ozone generated by each corona assembly.

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# III. LIMITATIONS

## A. Outline

There are many difficulties in making high quality color prints by an electrophotographic process, some of which are discussed below. The Color Laser Copier has many design features to minimize these difficulties, and they are very successful.

However, the prints are not of the same quality as those in high-quality printed material, such as magazine illustrations and photographs.

Each product has its own advantages and limitations, and users of the copying machine should be made aware of the capabilities of the machine.

## B. Characteristics

### 1. OPC

The sensitivity of the OPC used for the photosensitive drum is subject to the environment in which the machine is used and changes over time.

### 2. Reflectance of Toner

The ideal toners, representing the primary colors (yellow, magenta, and cyan), should absorb 100 percent of the spectrum of their complementary colors and reflect 100 percent of the rest. Such toners, however, are not available at present.

### 3. Dry Electrostatic Photography and Gradation

As shown in Figure 2-18, it is impossible to reproduce the density of the original document exactly the same because of the characteristics of photosensitive material and toner.

The powder toner, further, limits the details of the image to the diameter of its individual particles.

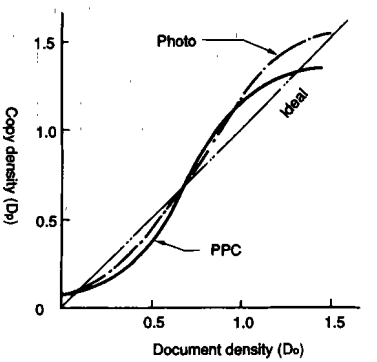


**Figure 2-18**

These limitations, however, have been solved to a point where they will not present visible problems by controlling the image processing and image processing by the scanner unit.


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# I. BASIC OPERATION

## A. Functional Construction

The copier's functions may be classified into six blocks: namely, pick-up/feeding system, original exposure system, laser exposure system, image formation system, and control system.

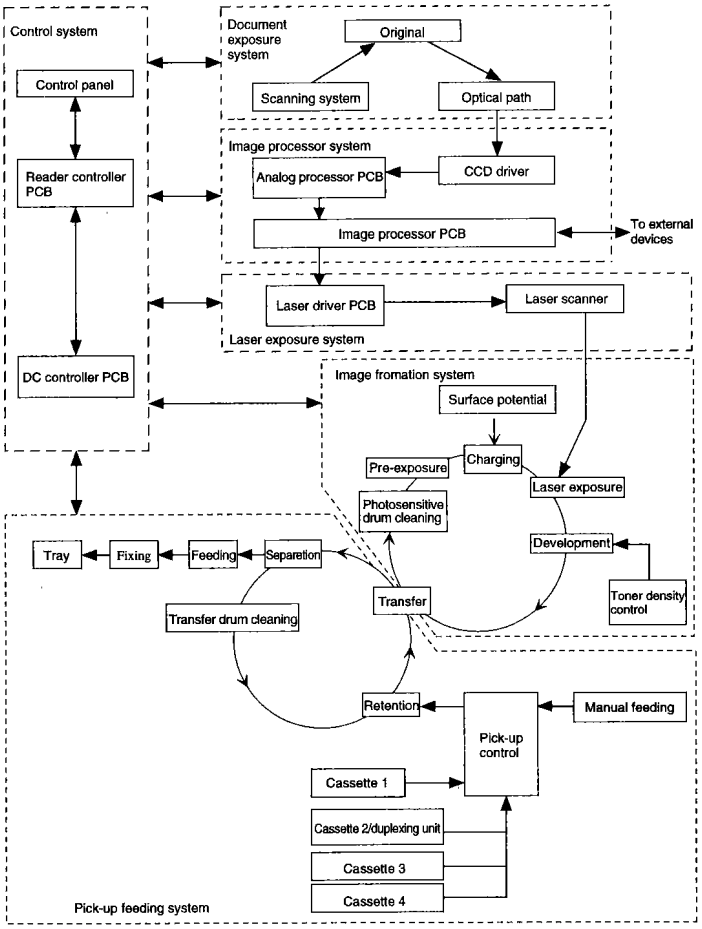


**Figure 3-101**

## B. Electrical Circuitry

The copier's major electrical mechanisms are controlled by a microprocessor found on the reader controller PCB and DC controller PCB. The reader controller PCB and DC controller PCB each are equipped with a lithium battery for backing up the data needed by the PCBs.

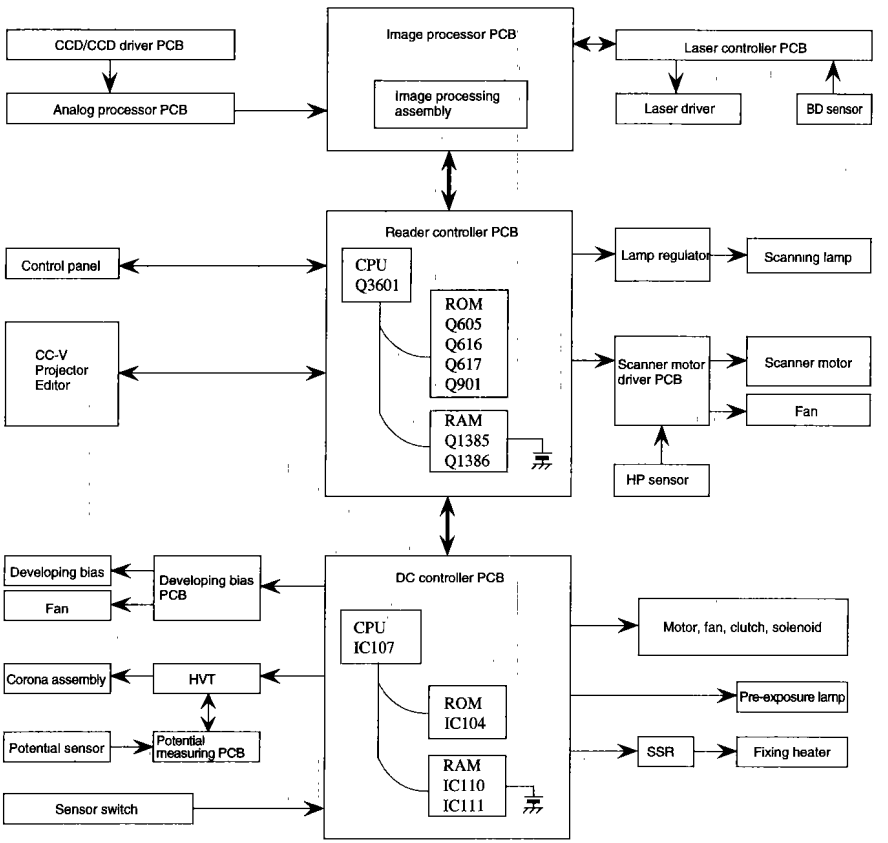


**Figure 3-102**


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# C. Inputs to and Outputs from Major PCBs

## Inputs to and Outputs from the Reader Controller (1/3)

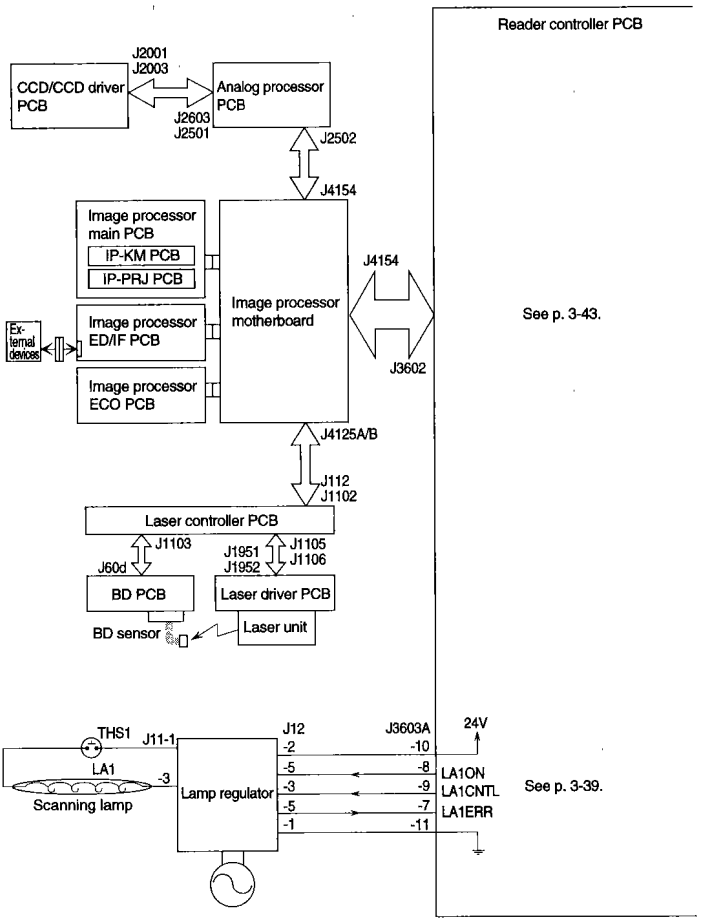


Figure 3-103

## Inputs to and Outputs from the Reader Controller (2/3. TYPE1)

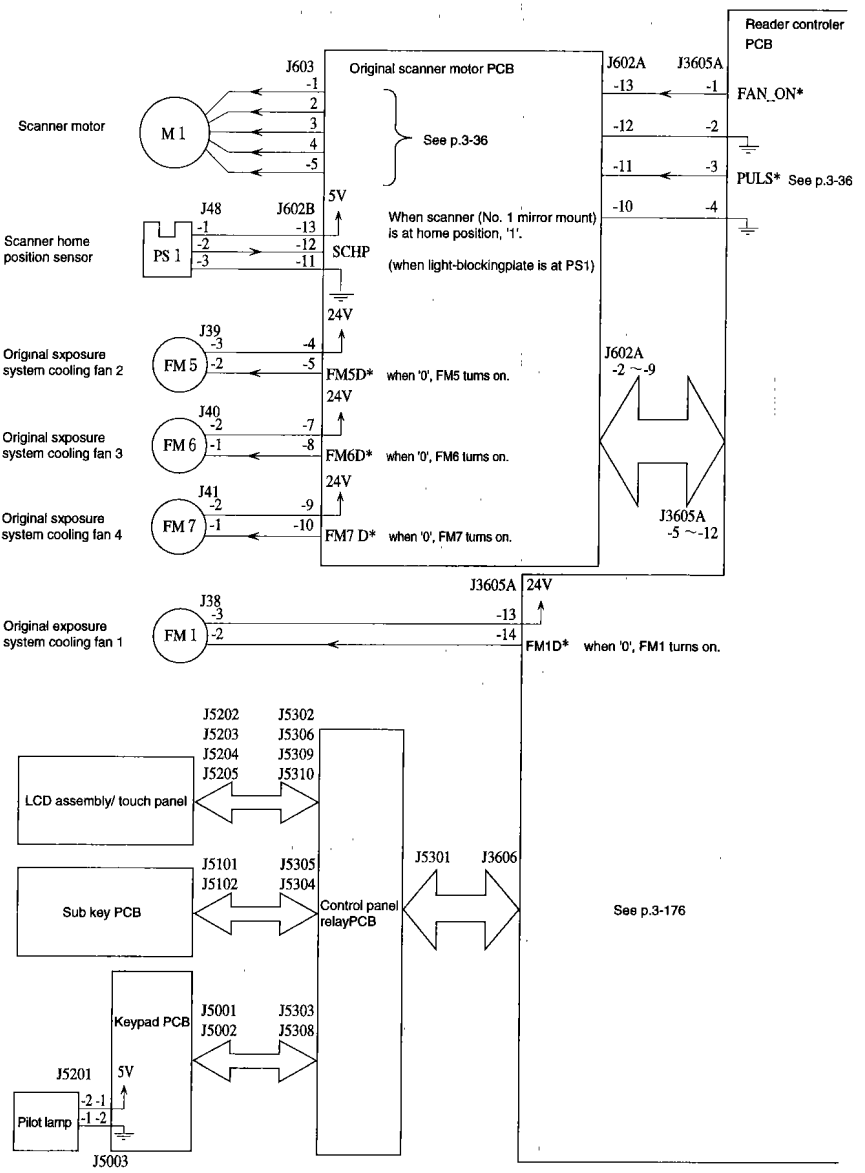


Figure 3-104A


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## Inputs to and Outputs from the Reader Controller (2/3. TYPE2)

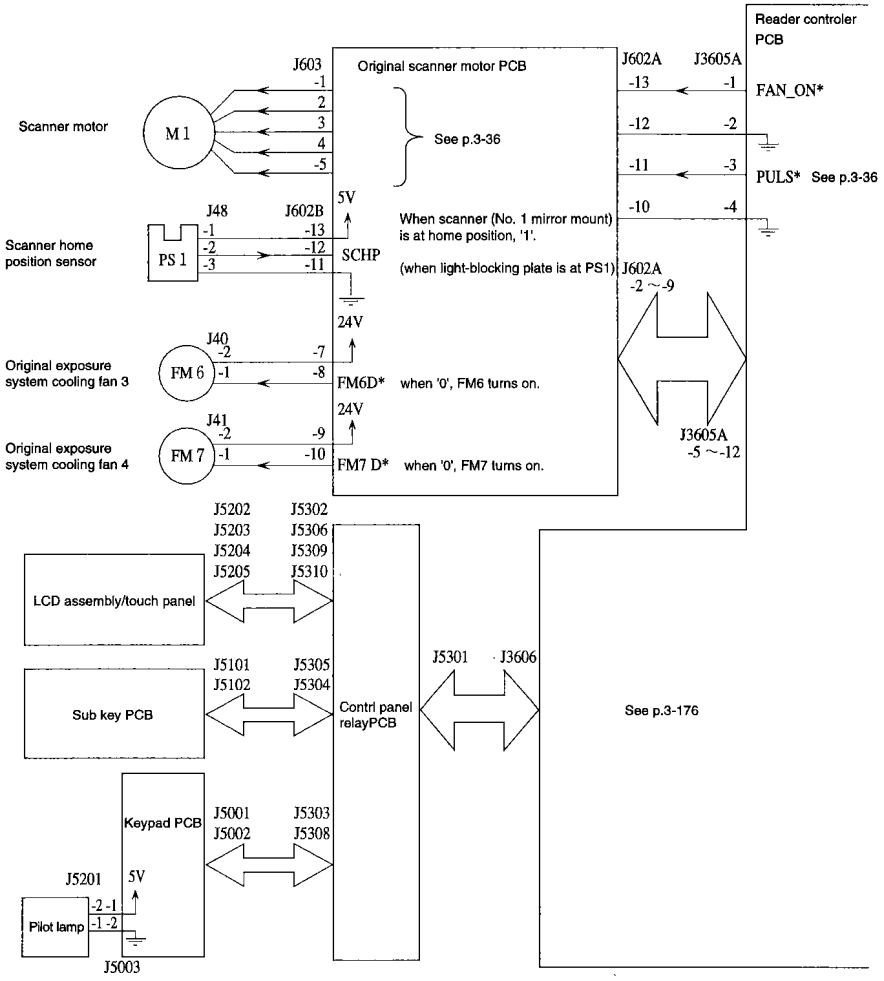


Figure 3-104B

## Inputs to and Outputs from the Reader Controller (3/3)

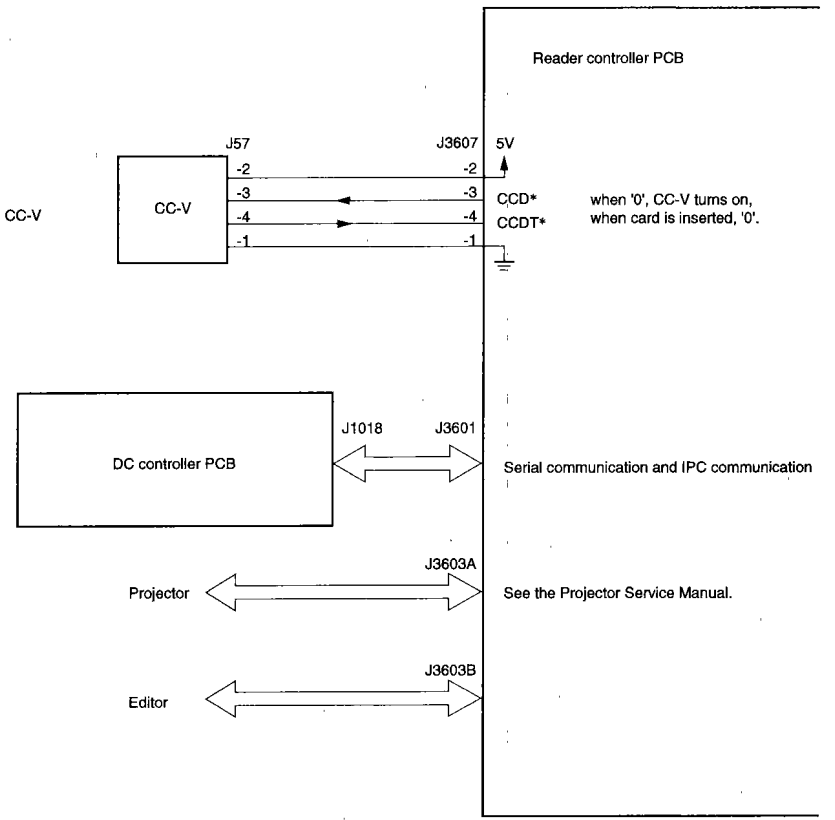


**Figure 3-105**


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## Inputs to the DC Controller (1/7)

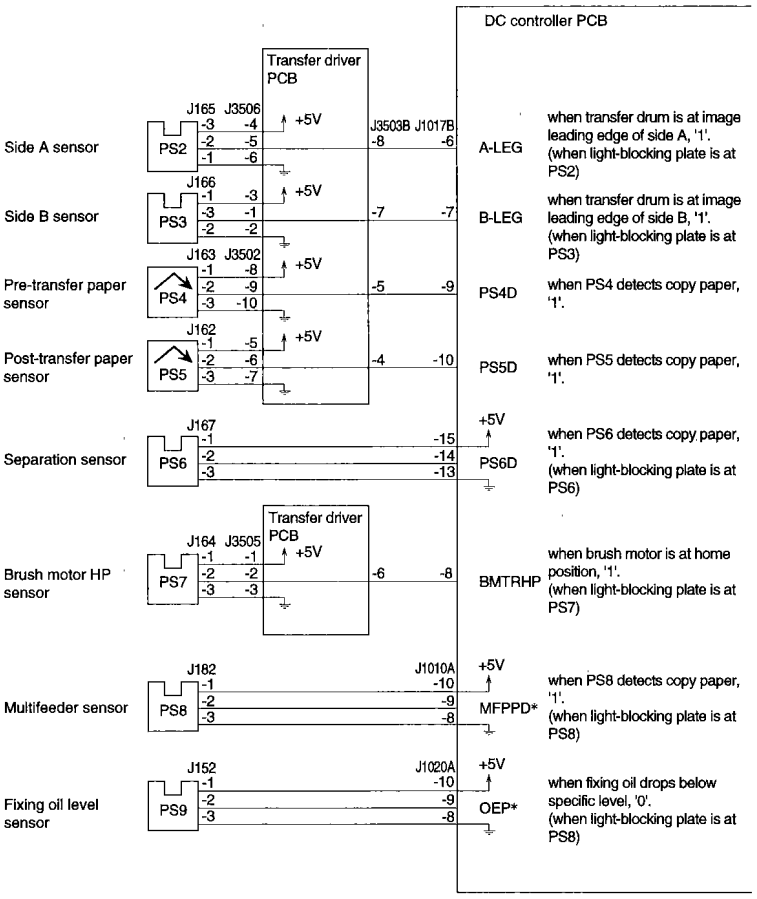


**Figure 3-106**

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## Inputs to the DC Controller PCB (2/7)

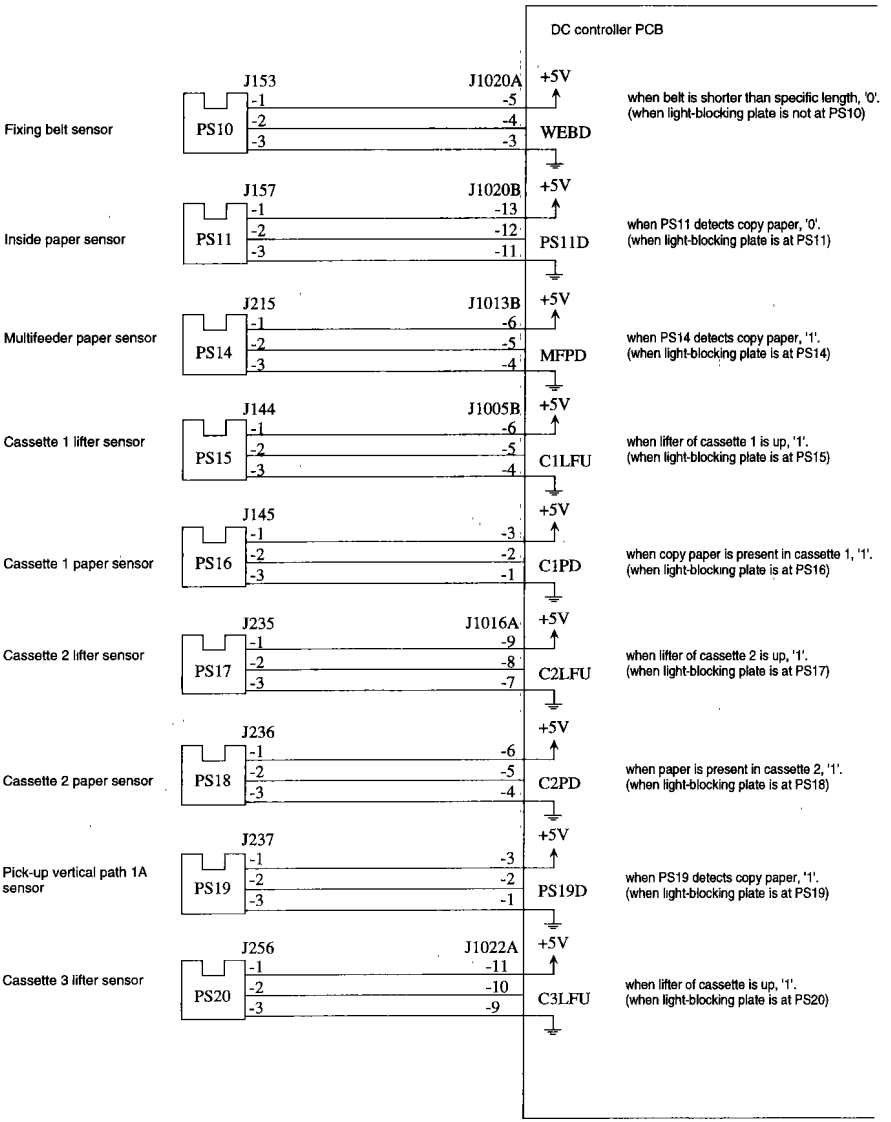


**Figure 3-107**


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## Inputs to the DC controller PCB (3/7)

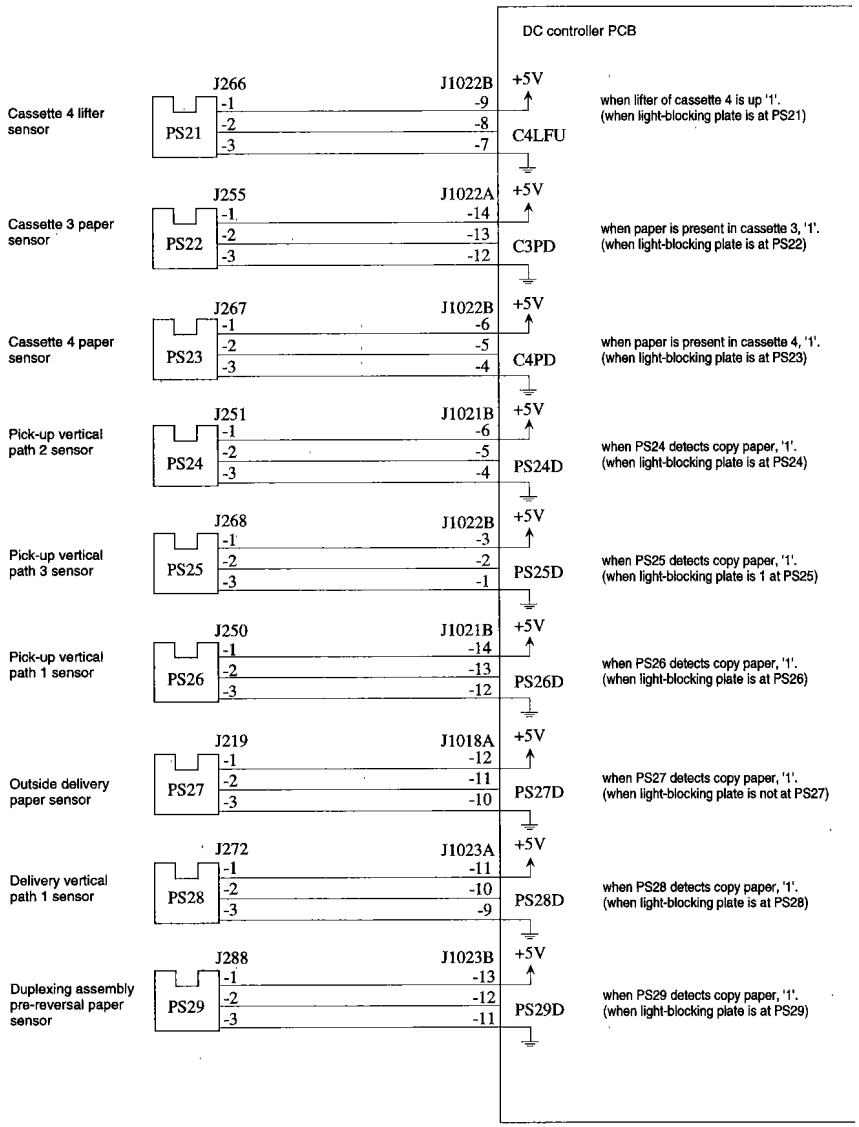
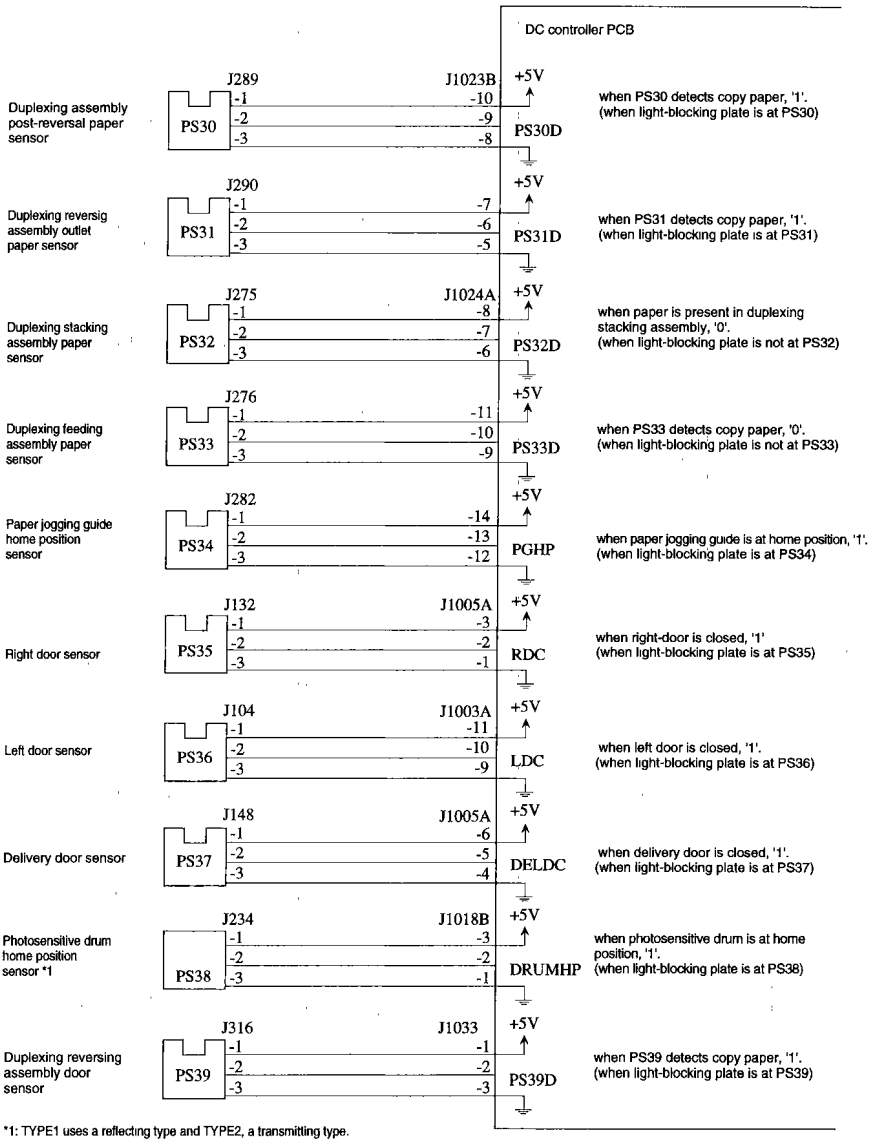



**Figure 3-108**

## Inputs to the DC Controller PCB (4/7)




*1: TYPE1 uses a reflecting type and TYPE2, a transmitting type.

**Figure 3-109**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## Inputs to the DC Controller PCB (5/7)

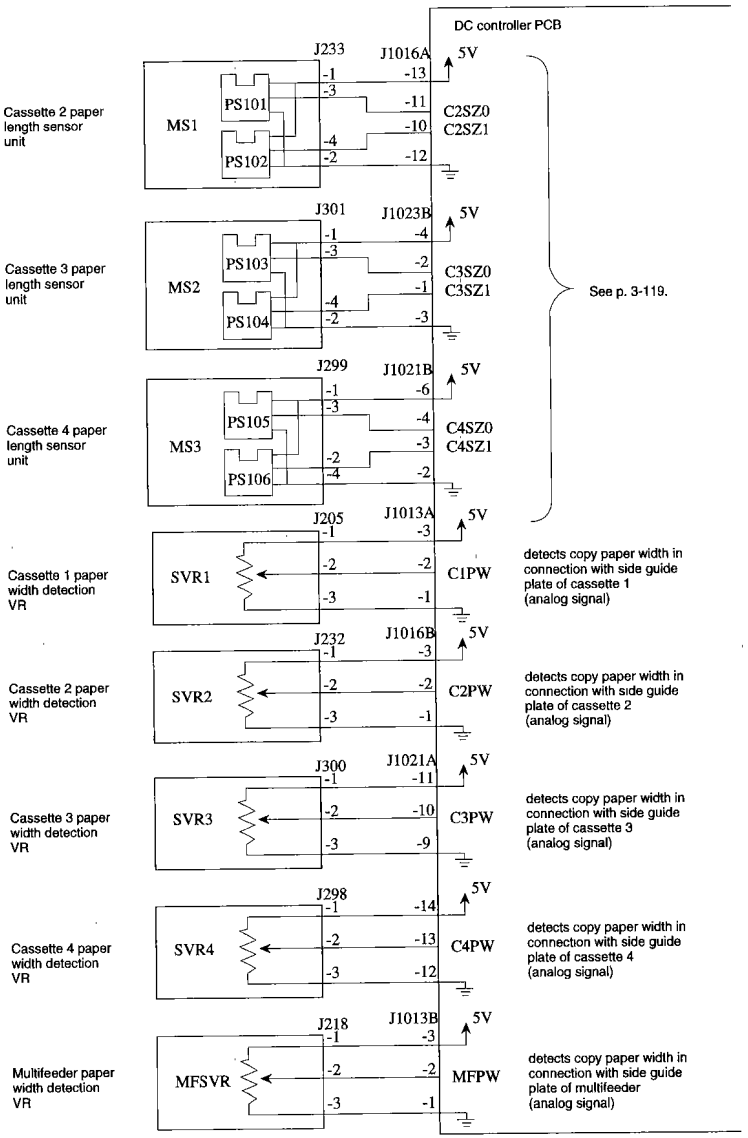


**Figure 3-110**

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## Inputs to the DC Controller PCB (6/7)

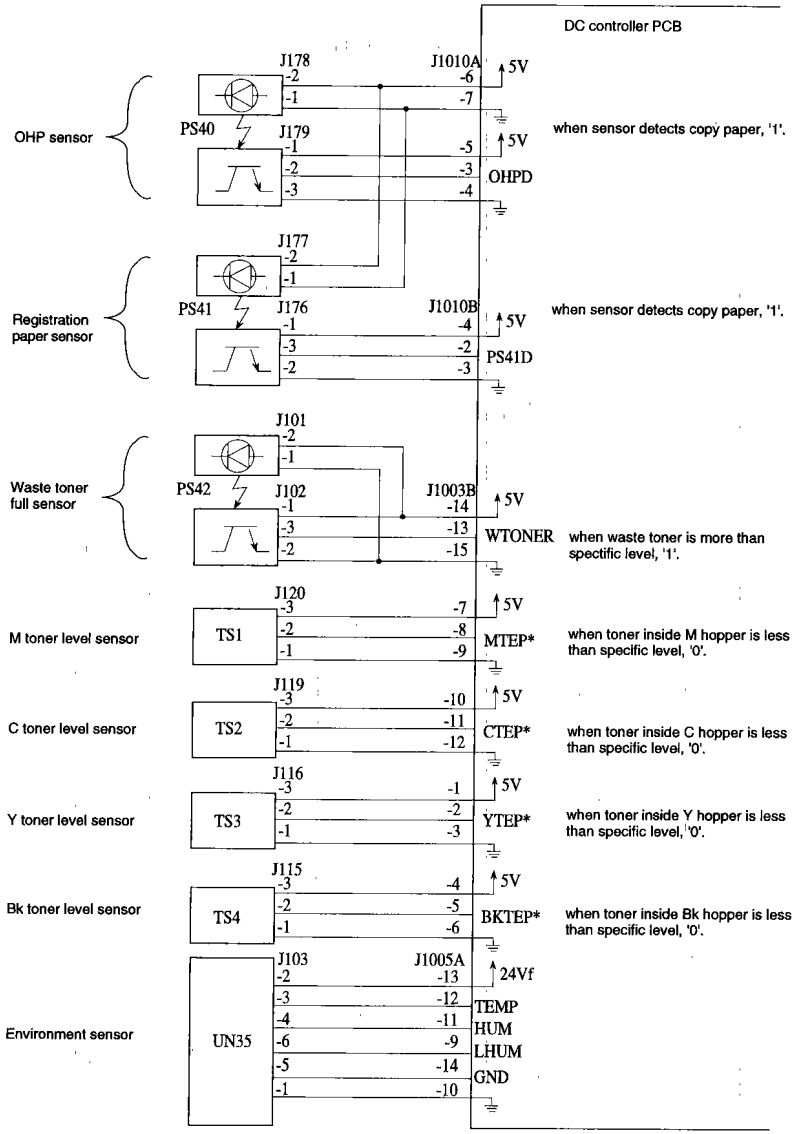


**Figure 3-111**


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## Inputs to the DC Controller PCB (7/7)

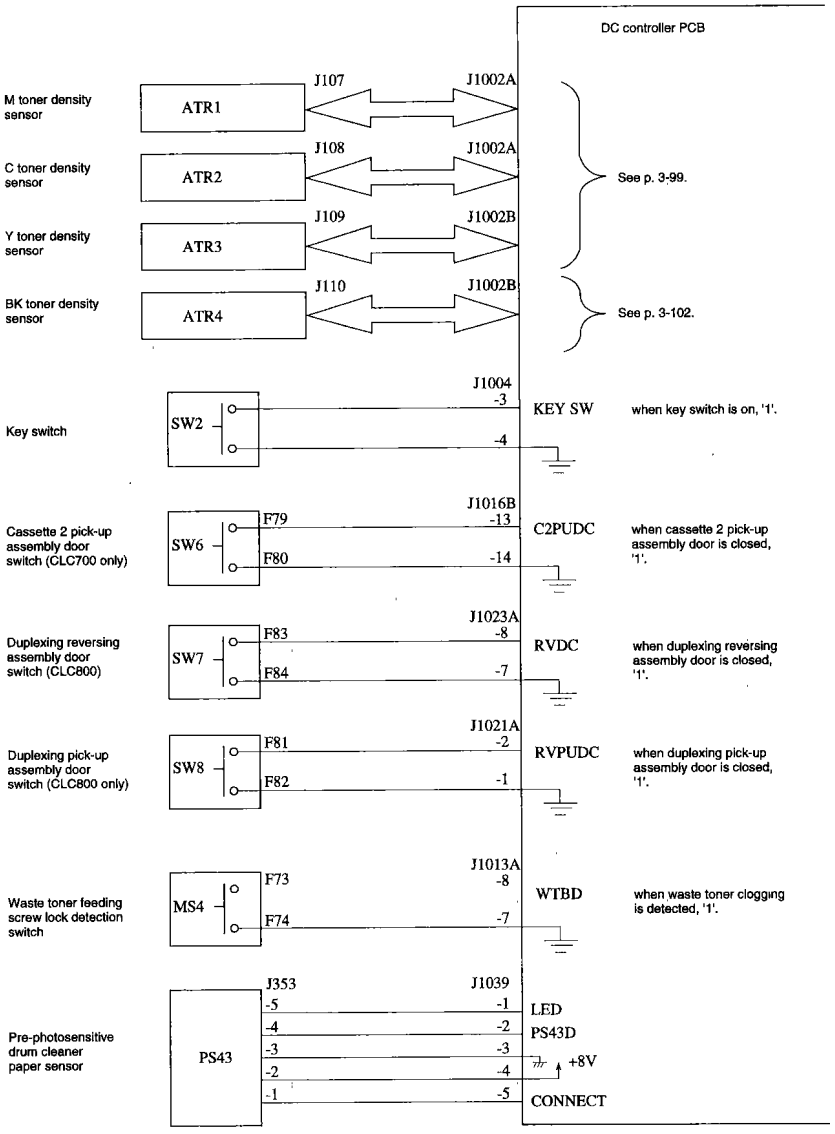
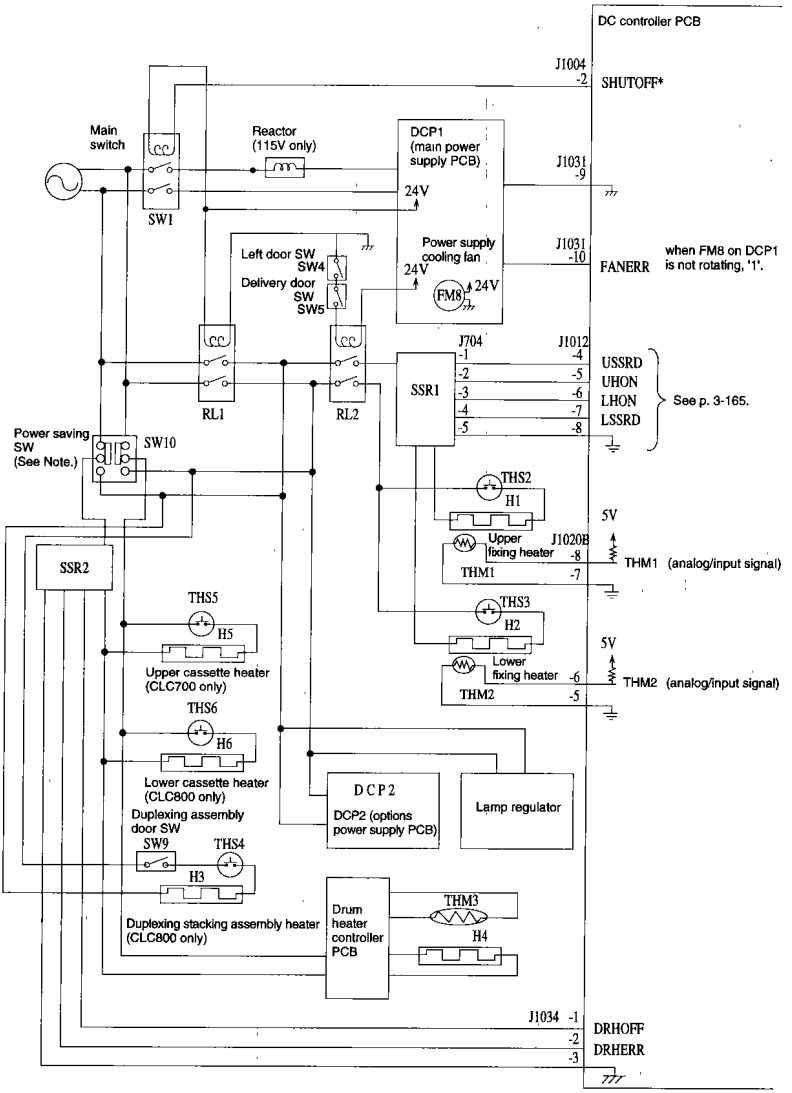



**Figure 3-112**

## Outputs from the DC Controller (1/10)




Note : The cassette heaters and drum heater remain on if SW10 is as indicated in the figure; when shifted down, it decomes synchronized with the main switch.

The heater in the duplexing unit stacking assembly always operates in conjunction with the main switch.

**Figure 3-113**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## Outputs form the DC Controller (2/10)

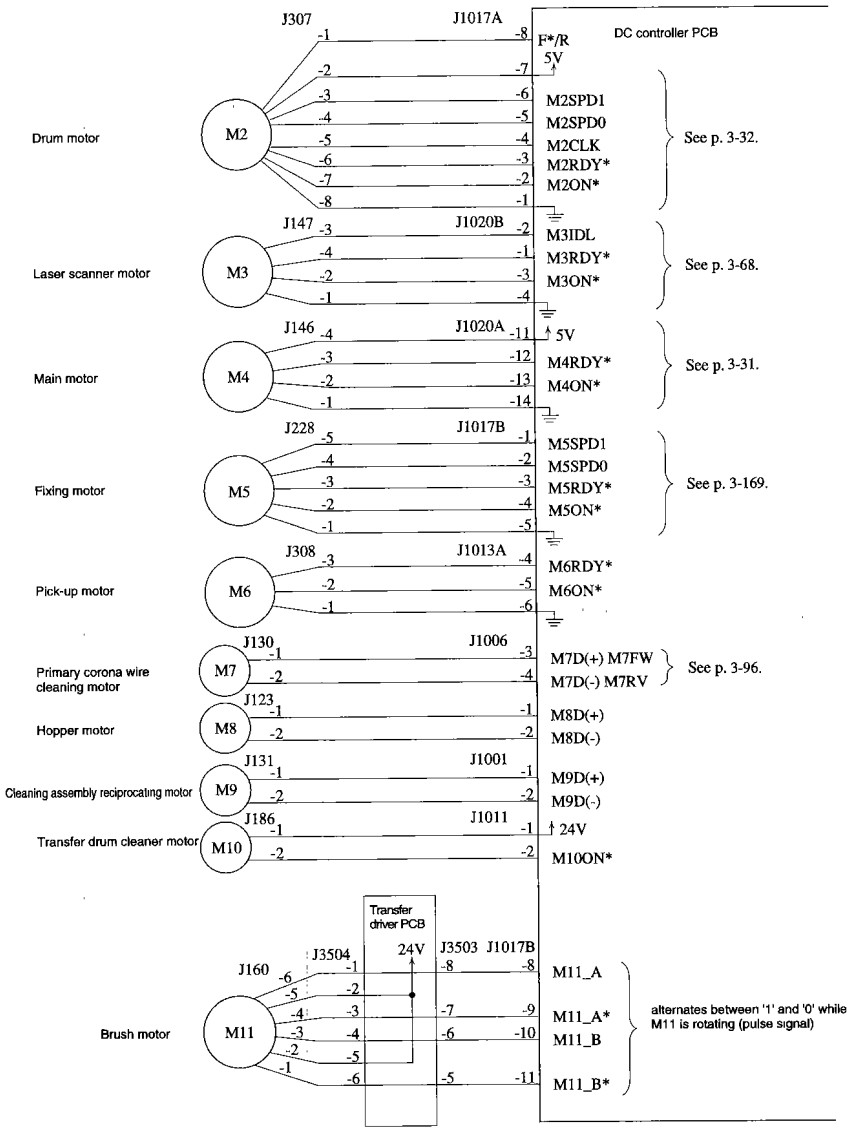


**Figure 3-114**

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## Outputs from the DC Controller (3/10)

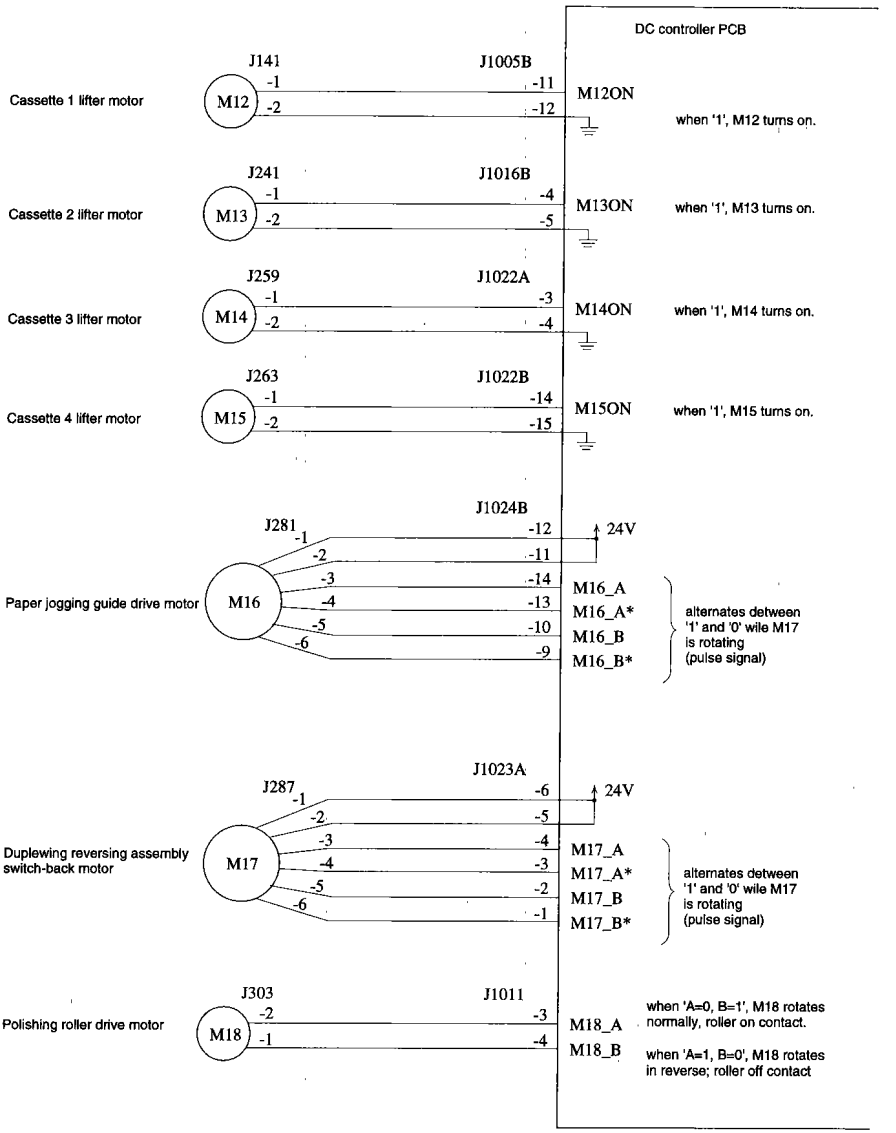


**Figure 3-115**


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## Outputs from the DC Controller (4/10. TYPE1)

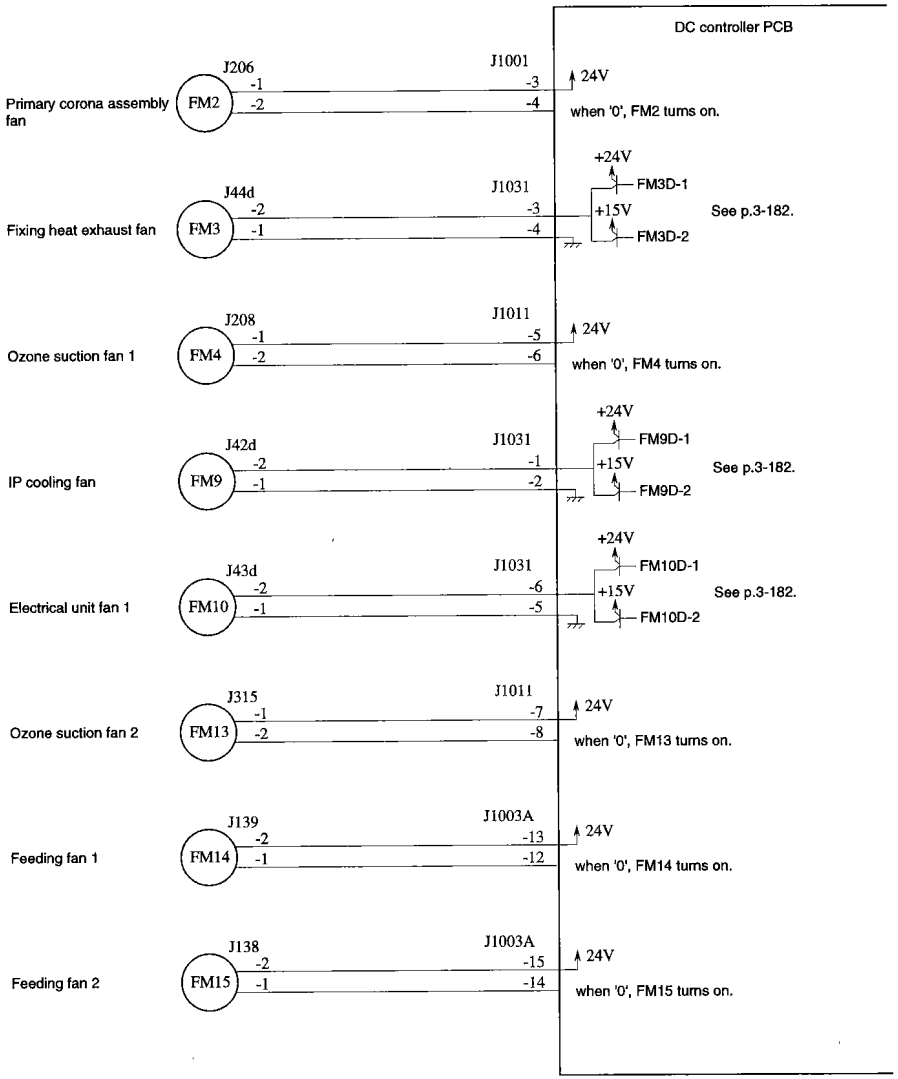
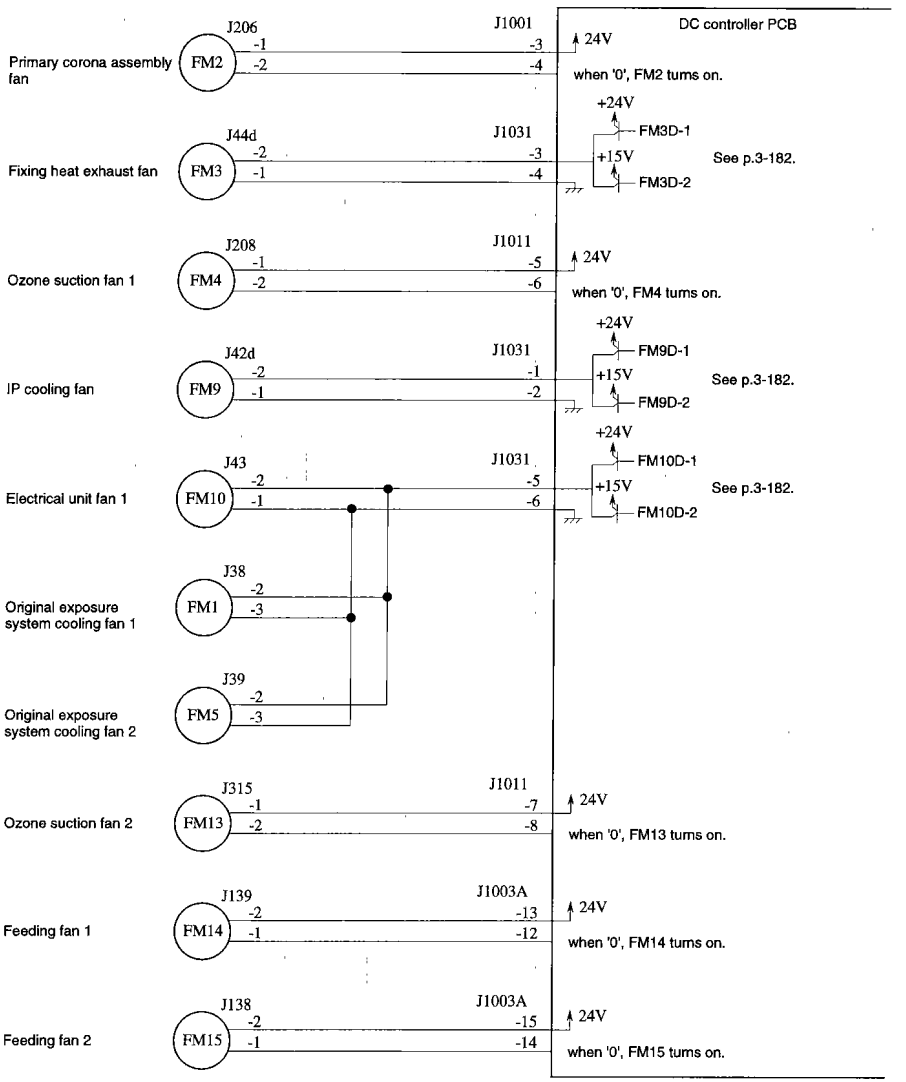



**Figure 3-116A**

## Outputs from the DC Controller (4/10. TYPE2)




For FM8, see Figure 3-113.
For FM12, see Figure 3-122.

**Figure 3-116B**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## Outputs from the DC Controller (5/10)

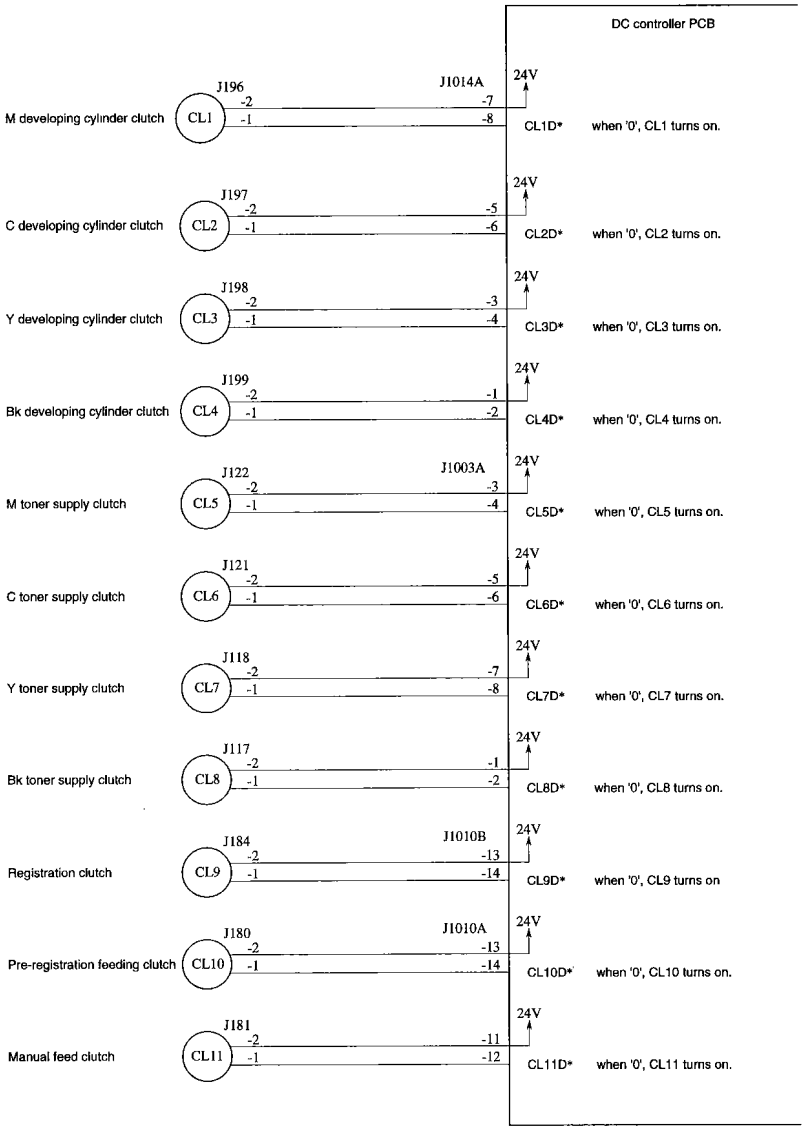


**Figure 3-117**

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## Outputs from the DC Controller (6/10)

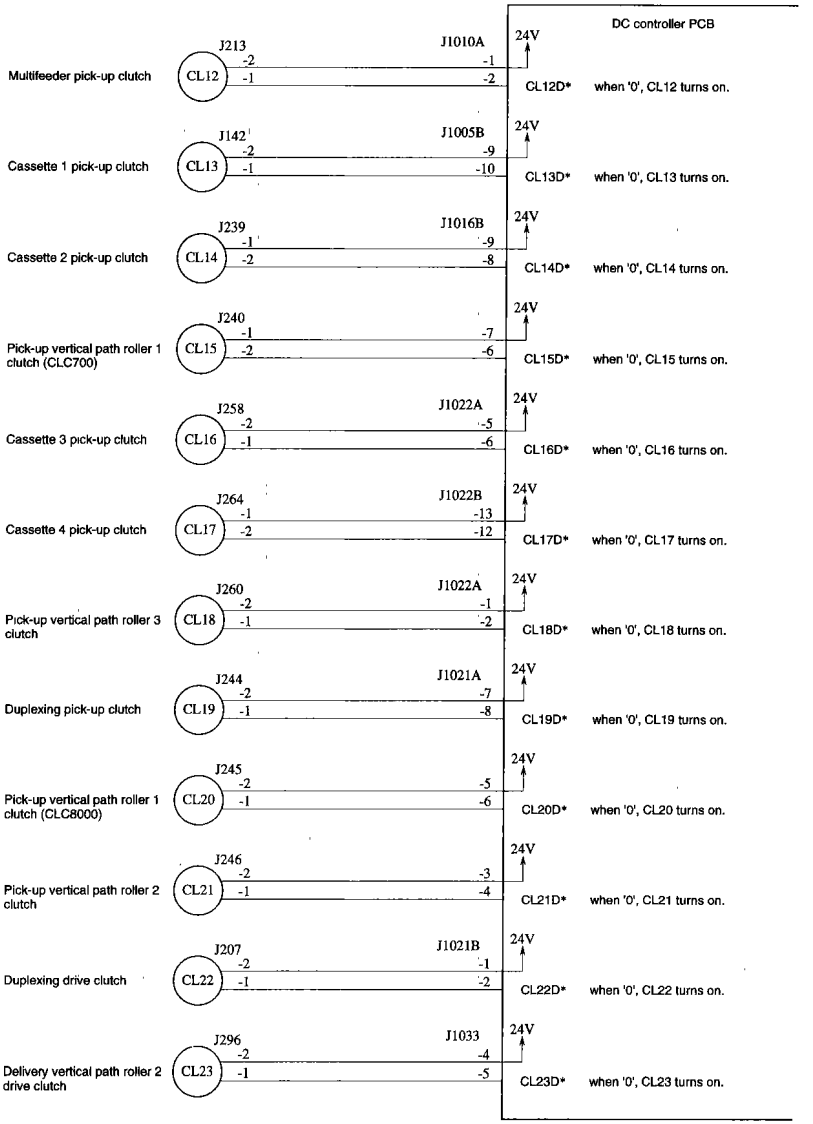


**Figure 3-118**


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## Outputs from the DC Controller (7/10)

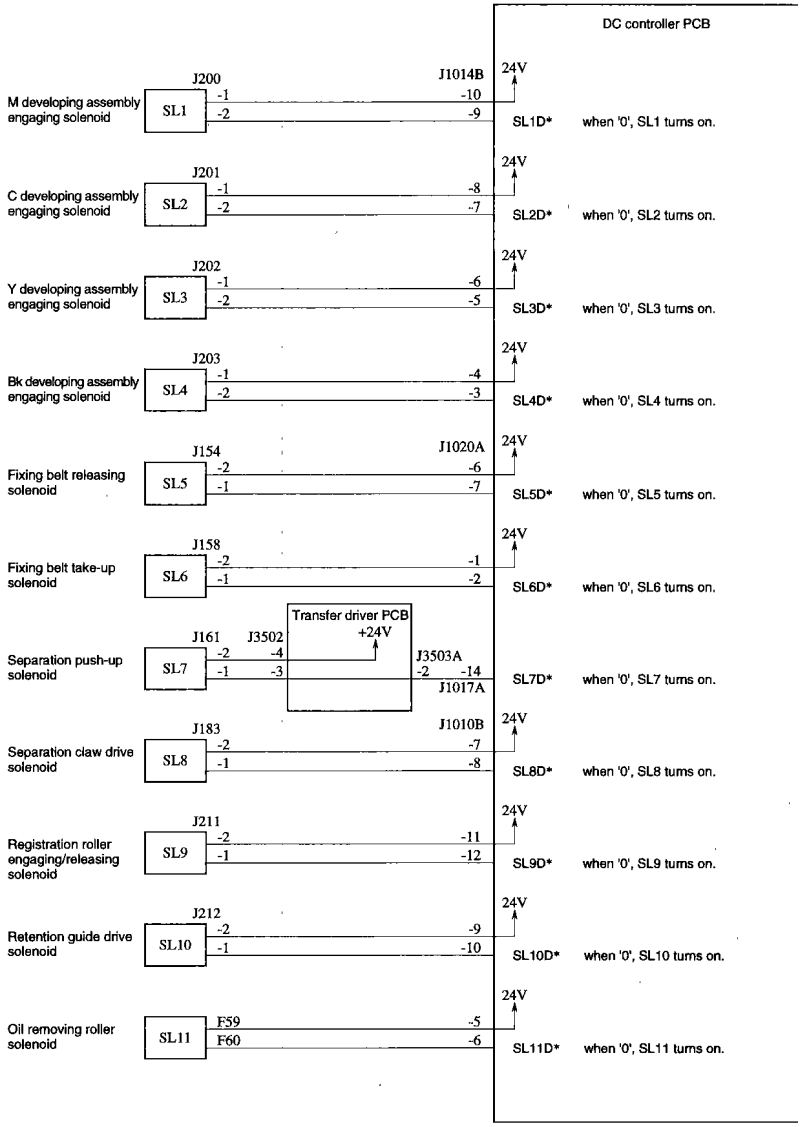


**Figure 3-119**

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## Outputs from the DC Controller (8/10)

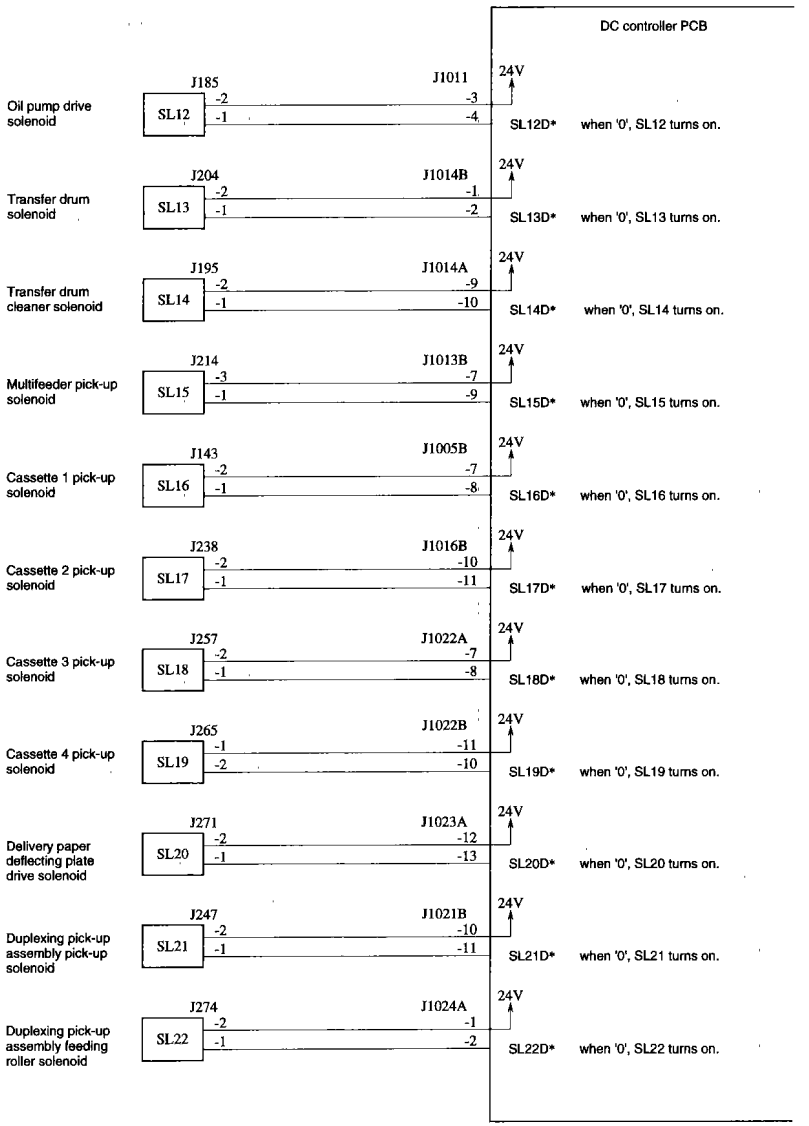


**Figure 3-120**


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## Outputs from the DC Controller (9/10)

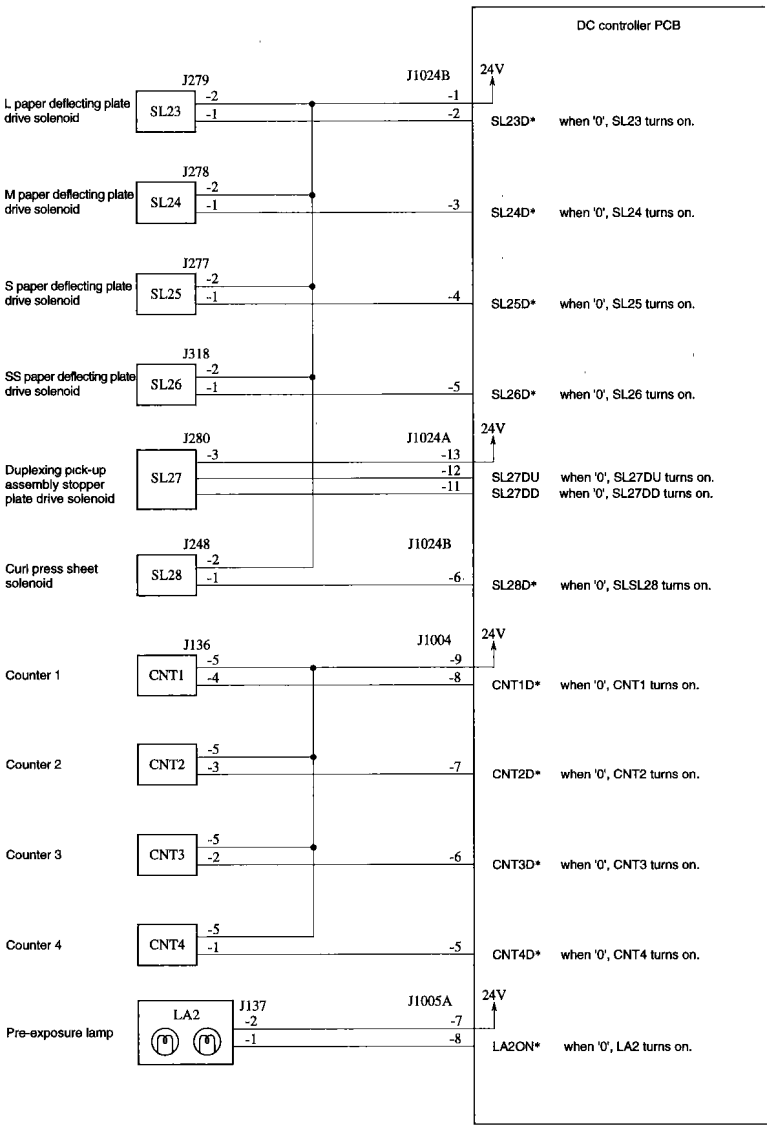


**Figure 3-121**

## Outputs from the DC Controller (10/10)

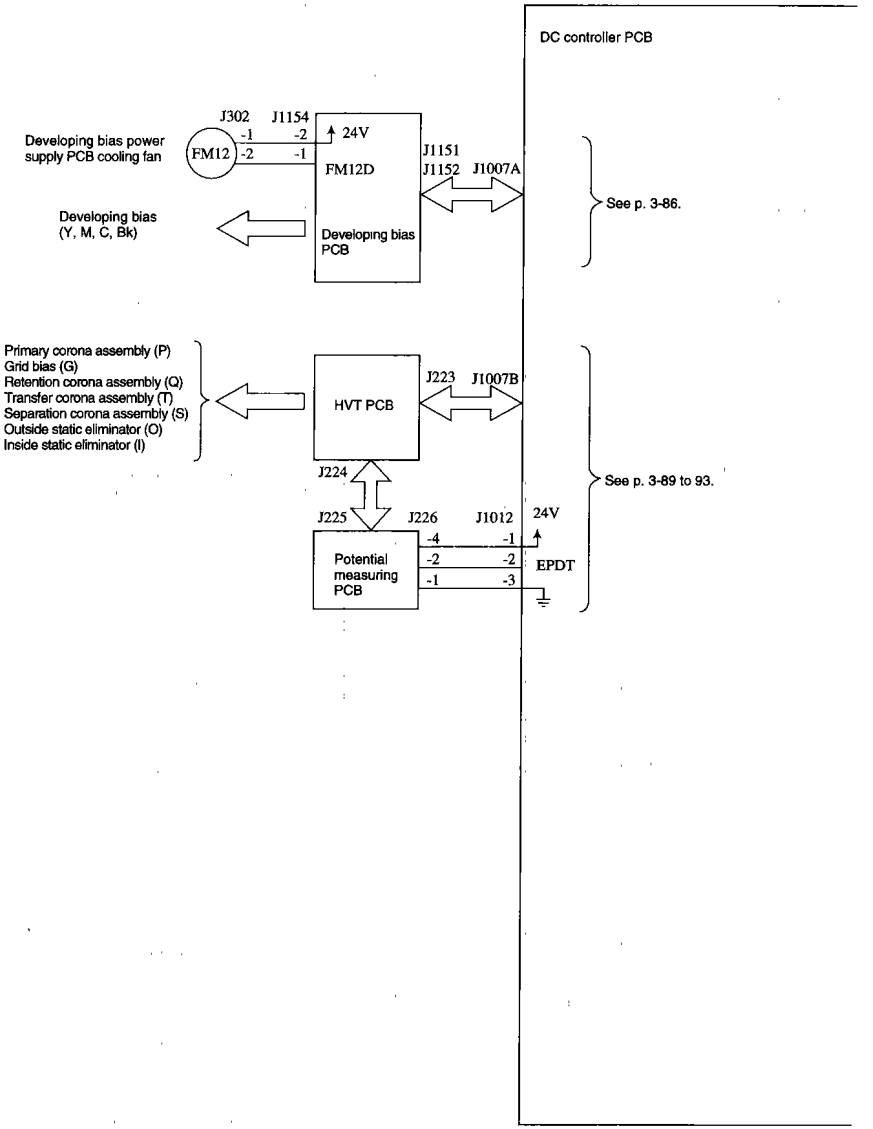


**Figure 3-122**


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# D. Basic Sequence of Operations

## 1. Sequence at Power-On

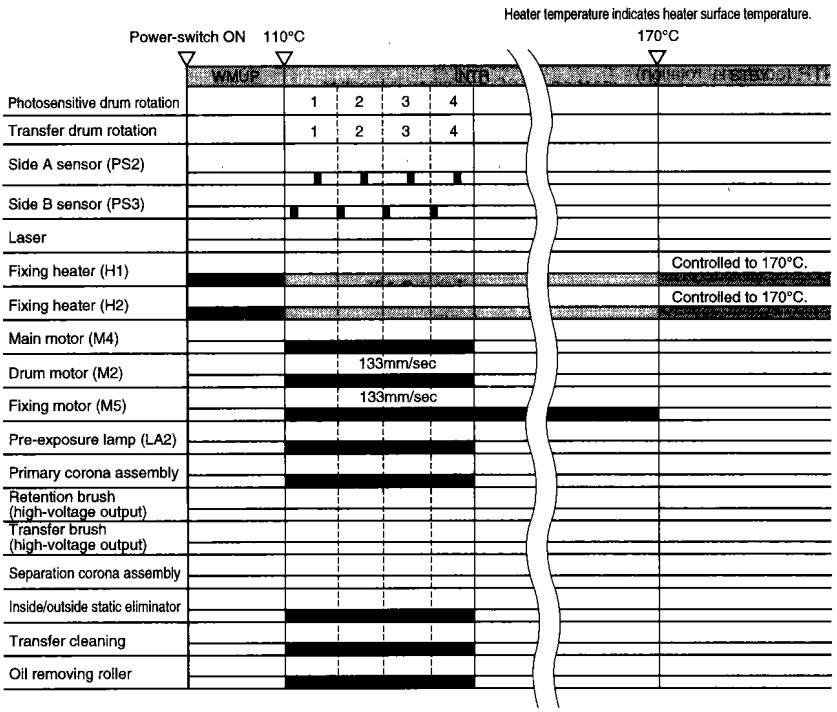


**Figure 3-123 Sequence at Power-On**

a. The copying operations are based on the side A sensor and the side B sensor used to detect the position of the transfer drum. For control executed based on other signals, see the respective timing charts.
b. The outside diameter of the transfer drum is the same as that of the photosensitive drum, and both drums come into contact with each other as necessary (copying) the photosensitive drum makes a single rotation for each rotation of the transfer drum.
c. The fixing temperature indicates the surface temperature of the fixing roller, i.e., the value indicated under ANALOG of DISPLAY in service mode (temperature detected by a thermistor).

| Period | | Description | Remarks |
|---|---|---|---|
| WMUP (warm-up) | Between when the power switch has been turned on and when the surface temperature of the upper fixing roller reaches 110°C. | Waits from the fixing roller to warm up. | |
| INTR (additional rotation) | Between when the surface temperature of the upper fixing roller has reached 110°C and when it reaches 160°C. | | |
| STBY (standby) | Between when INTR is over and when the Copy Start key is pressed or the Power switch is turned off. | Waits for a press on the Copy Start key or any other operation key. | |

**Table 3-101**


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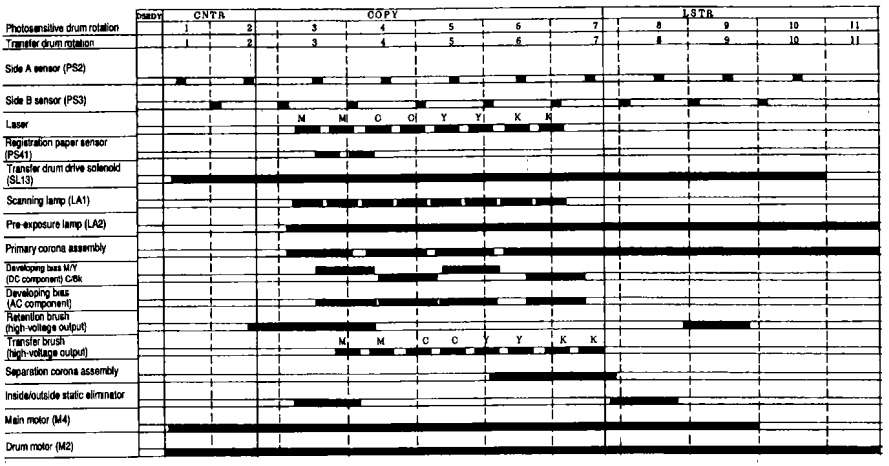


**Figure 3-124 (A4/LTR, 2 copies, DIRECT, cassette 1)**

| Period | | Description | Remarks |
|---|---|---|---|
| DSRDY (scanner ready) | Between when the Copy Start key has been pressed and when the transfer drum starts to rotate. | Executes a document detection scan.<br>Executes shading correction. | |
| CNTR (control rotation) | Between when the DSRDY is over and when attraction of copy paper starts. | Measures and controls the surface potential of the drum. | |
| COPY (copy) | Between when the transfer drum starts to attract copy paper and when all toner has been trasferred to the copy paper. | Turns on and off the laser beam based on the video signals, develops specified colors, and transfers. | |
| LSTR (post rotation) | Between when COPY ends and when the drum motor stops. | Discharges copy paper.<br>Stabilizes the sensitivity of the photosensitive drum.<br>Discharges the transfer drum (cleaning). | |

**Table 3-102**

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# E. Generating the Image Leading Edge Signal

## 1. Outline

The copier controls sequences of copying operations with reference to the leading edge of copy paper on the transfer drum.

Figure 3-125 shows the position of copy paper at the time the image leading edge signal is generated within the transfer drum.

The distance between the point of laser exposure and the point of transfer on the photosensitive drum (a) and the leading edge of copy paper and the point of transfer on the transfer drum (b) are equal.

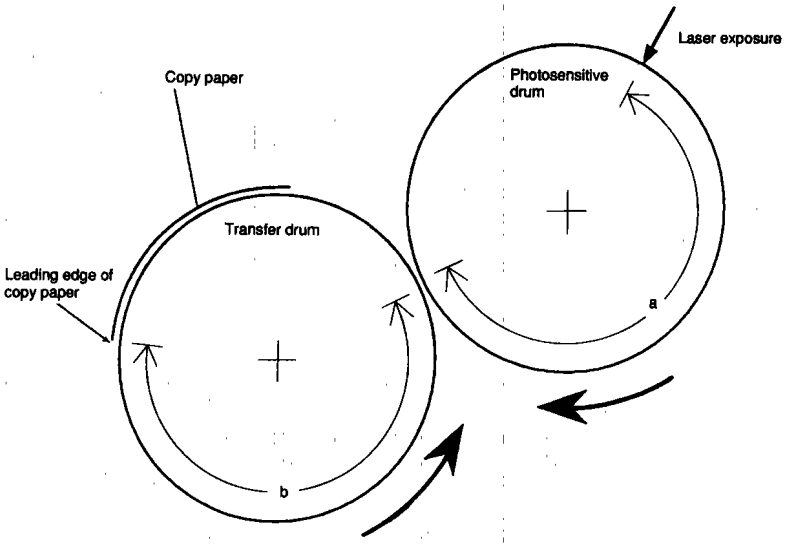


Figure 3-125


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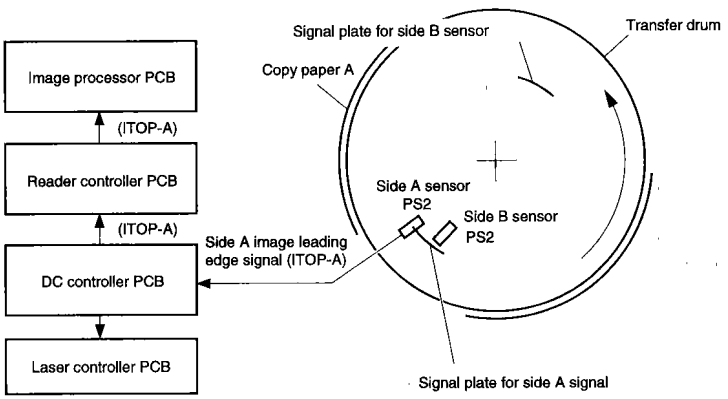
## 2. Controlling Side A and Side B

The copier must deposit a maximum of four different colors (toner) on the same spot; to ensure correct deposits of toner, it controls the original exposure, image processing, laser exposure, high voltage, and feeding sequences with reference to the leading edge of copy paper.

A maximum of two sheets of copy paper are retained on the transfer drum at the same time, and the sensor (PS2, side A sensor; PS3, side B sensor) inside the transfer drum unit and the two signal plates that operate in connection with the transfer drum are used to generate the image leading edge signal (ITOP-A, ITOP-B) for each sheet of copy paper.

- Transfer Drum When Copying on Side A




- Transfer Drum When Copying on Side B

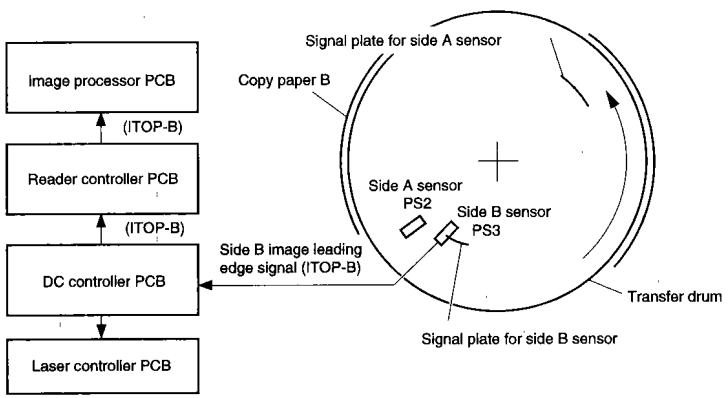



**Figure 3-126**

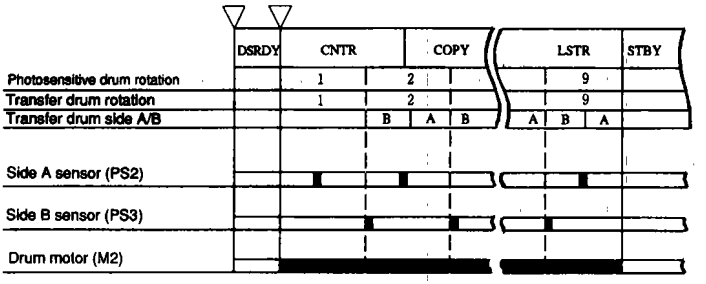



**Figure 3-127**

Figure 3-128 shows the way copy paper is retained on the transfer drum in each copy mode. In mono color mode, paper is retained in the same way as M for C, Y, and Bk.

Small size paper .....216 mm or less in feeding direction (A4/LTR or less)
Large size .....217 mm or more in feeding direction
2/M .....2, second sheet of paper; M, M-color development

- In the table, the small and large sizes do not necessarily represent the size notations used in relation to the cassettes.
- When copies are made on small-size paper without potential measurement, CNTR ends earlier* and copying starts on side B.

*Equivalent of a 0.5 rotation in relation to the transfer drum.

CNTR end ▽

| Transfer drum rotation | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Copy paper leading edge | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA | BA |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mono (M) | Small (5 sheets) | 1/M 2/M | 3/M 4/M | 5/M | | | | | | | | | |
| | Large (3 sheets) | 1/M | 2/M | 3/M | | | | | | | | | |
| 3-color (MCY) | Small (5 sheets) | 1/M 2/M | 1/C 2/C | 1/Y 2/Y | 3/M 4/M | 3/C 4/C | 3/Y 4/Y | 5/M | 5/C | 5/Y | | | |
| | Large (3 sheets) | 1/M | 1/C | 1/Y | 2/M | 2/C | 2/Y | 3/M | 3/C | 3/Y | | | |
| 4-color (MCYBk) | Small (5 sheets) | 1/M 2/M | 1/C 2/C | 1/Y 2/Y | 1/Bk 2/Bk | 3/M 4/M | 3/C 4/C | 3/Y 4/Y | 3/Bk 4/Bk | 5/M | 5/C | 5/Y | 5/Bk |
| | Large (3 sheets) | 1/M | 1/C | 1/Y | 1/Bk | 2/M | 2/C | 2/Y | 2/Bk | 3/M | 3/C | 3/Y | 3/Bk |

**Figure 3-128**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## F. Main Motor

The main motor (M4) is a brushlesss DC motor equipped with a built-in rotation speed control circuit. It rotates at a specific speed when the DC controller PCB causes the main motor drive signal (M4ON*) to go '0'.

If the rotation speed of the motor deviates for some reason, the motor causes the main motor ready signal (M4RDY*) to go '1', and the DC controller PCB indicates 'E010' on the control panel.

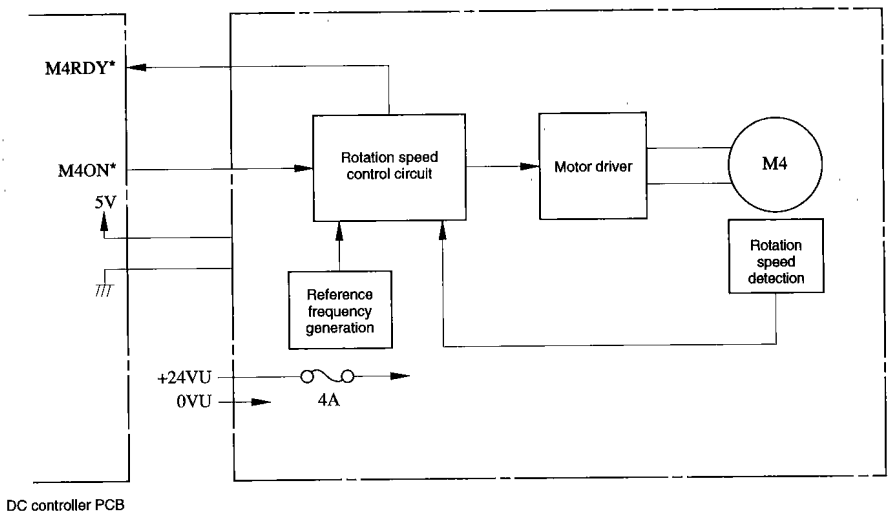


Figure 3-129

## G. Drum Motor

The transfer drum motor (M2) is a brushless DC motor equipped with a rotation speed control circuit. It rotates at a specific speed when the DC controller PCB causes the drum motor drive signal (M2ON*) to go '0'.

The drum motor is controlled to four different speeds according to two speed control signals (M2SPD0, M2SPD1) generated by the DC controller PCB.

The DC controller PCB monitors the rotation detection signal (M2CLK) while the drum motor is rotating; if the speed deviates for some reason, the motor causes the drum motor ready signal (M2RDY) to go '1', and the DC controller PCB indicates 'E012' on the control panel.

**Reference:**

The copier controls the fixing speed in four stages to ensure proper fixing when making two-sided copies and using thick paper or transparencies. In addition, since the feeding path between the transfer drum and fixing unit is short, the drum motor must also be controlled to four speeds according to the fixing speeds. (See p. 3-169.)

| | M2SPD0 | M2SPD1 |
|---|---|---|
| Normal | 0 | 0 |
| Duplexing | 0 | 1 |
| Thick paper | 1 | 0 |
| Transparency | 1 | 1 |

**Table 3-103**

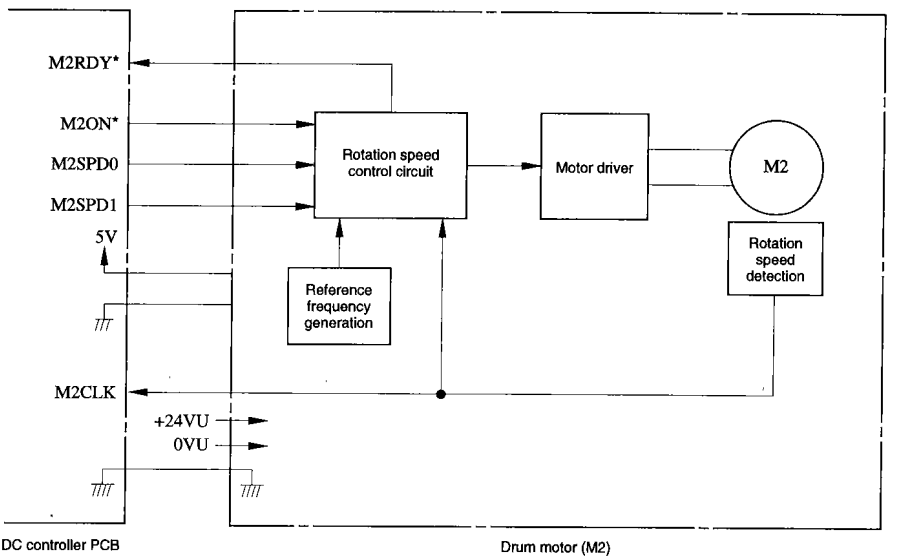


**Figure 3-130**


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# II. ORIGINAL EXPOSURE SYSTEM

## A. Outline

The original exposure system refers to the functions involving those processes executed between when an original is exposed and when the reflected light is directed to the CCD. See Figure 3-201 for a cross section of the original exposure system and Figure 3-202 for its external view.

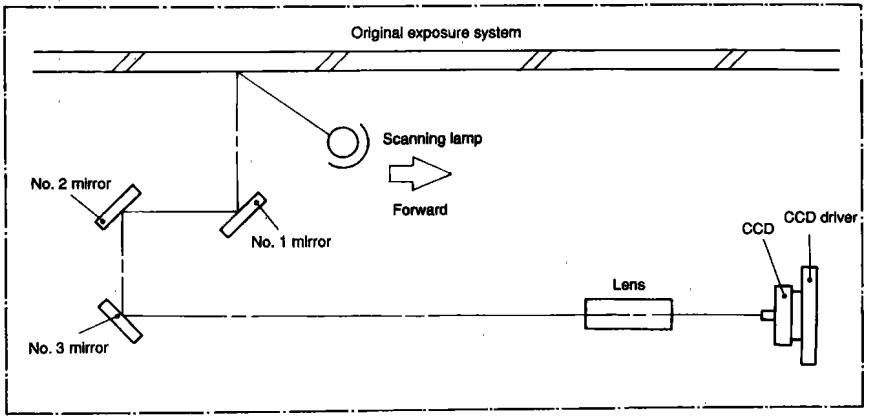



Figure 3-201

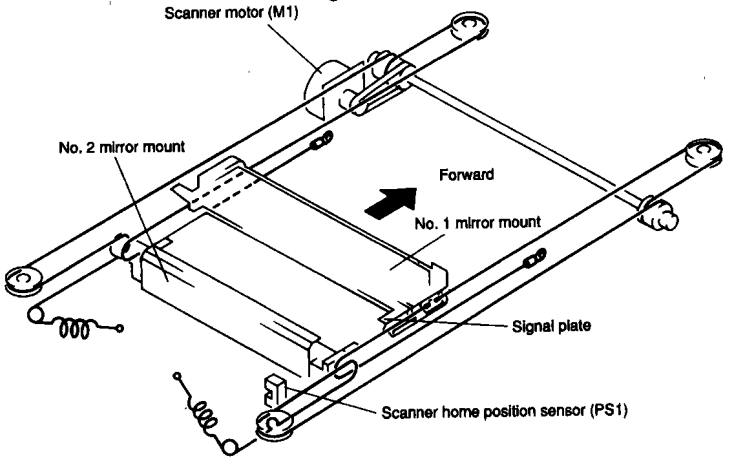
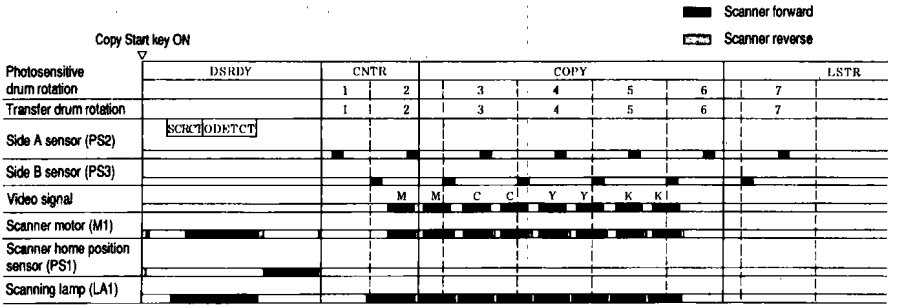



Figure 3-202

# B. Basic Sequence of Exposing Originals

## 1. Sequence




SCRCT: Measures the shading correction position.
ODETCT: Identifies the document position, black original, and executes AE measurement.

**Figure 3-203 (A4/LTR, 2 copies, 4 colors, DIRECT, cassette 1)**

## 2. Scanner Home Position Sensor and Operation

| | Scanner Motor | | Description |
|---|---|---|---|
| | Forward | Reverse | |
| Scanner home position sensor (PS1: SCHP) | | | Switches to forward. |
| | | | Moves forward by 1 mm, and stops; the point is used as the home position. |

**Table 3-201**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The scanner home position sensor turns on only for the following conditions:

- at the start of copying operation.
- when all scans for the specified number of copies have been completed.
- during CCD adjustment.

The sensor does not turn on during continuous copying. Should it turn on because of an error, the ongoing original scan is stopped immediately. Figure 3-204 shows the movement of the scanner during copying operation; the start position is about 5 mm in the forward direction from the home position (DIRECT).

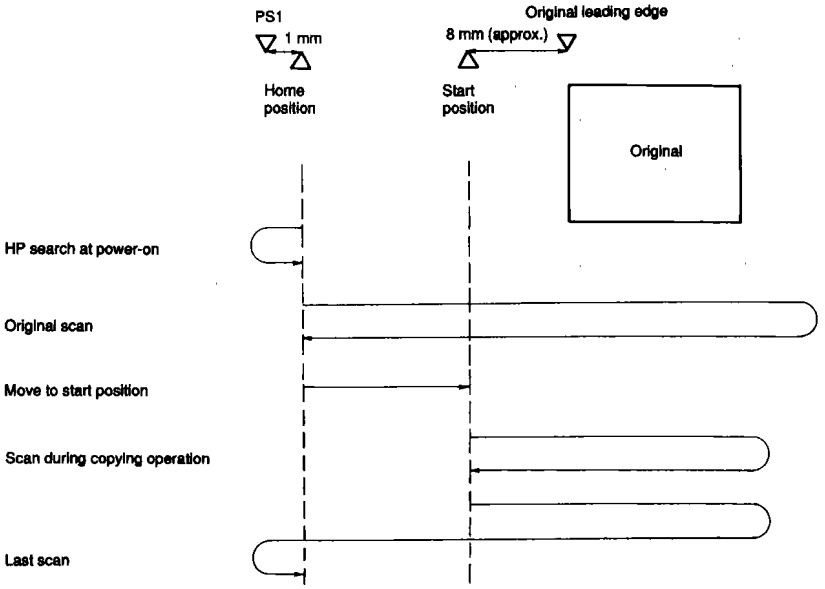


**Figure 3-204**

## C. Original Scanner Motor

### 1. Outline

Figure 3-206 shows the circuit that controls the scanner motor with the following functions:

① Controls the rotation direction of the scanner motor.

② Controls the rotation speed of the scanner.

The original scanner motor changes its rotation direction depending on whether the scanner is moving forward or in reverse; the rotation speed when the scanner is moving forward varies depending on the selected reproduction ratio.

The rotation speed when the scanner is moving in reverse remains constant regardless of the selected reproduction ratio, and is about 10 times the speed at which it rotates when the scanner is moving forward (DIRECT), making reversal fast.

**Reference:**

When two sheets of copy paper is retained on the transfer drum, the distance between the two sheets is highly limited (as small as 66 mm); the scanner is moved at a speed that enables it to reverse within this short distance.

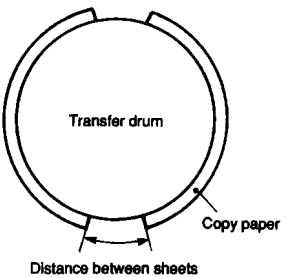


Figure 3-205

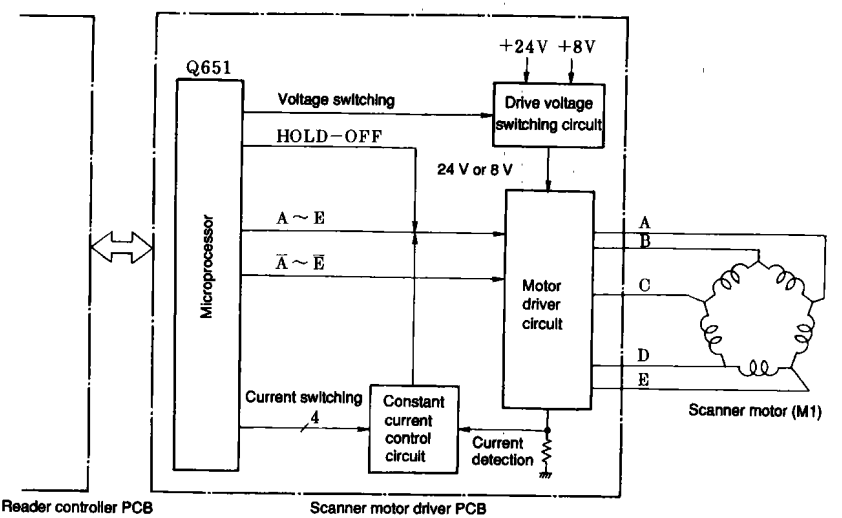


Figure 3-206


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## 2. Operation

The microprocessor (Q651) on the scanner motor driver PCB receives mode, distance, and reproduction ratio instructions for the scanner from the reader controller PCB. Upon receipt, it uses the instructions and drive pulses to the scanner motor. The scanner motor is a 5-phase stepping motor, and controls the direction and speed of the scanner by changing the sequence and frequency of drive pulses (A through E).

The drive voltage switching circuit switches the power used to drive the motor from 8 V (forward) to 24 V (reverse) to rotate the motor at a high speed when moving the scanner forward and in reverse.

The constant current control circuit controls the current so that the current flowing into the motor is appropriate to each rotation speed.

When the motor is at rest during standby mode, the current flowing into the motor is cut off by the HOLD-OFF signal, thereby preventing overheating of the motor.

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## D. Varying the Reproduction Ratio

The reproduction ratio in the main scanning direction (drum axial) is varied by skipping image signals written in the line memory (reduction) or repeating data read from the line memory (enlargement).

The reproduction ratio in the sub scanning direction is varied by moving the mirror mount faster (reduction) or slower (enlargement).

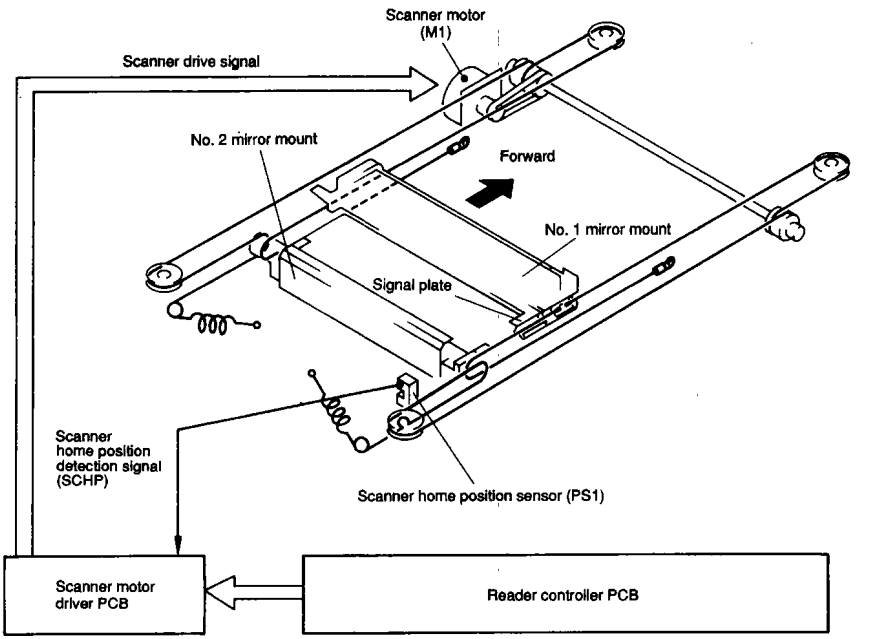


Figure 3-207


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# E. Controlling the Scanning Lamp Intensity

## 1. Outline

Figure 3-208 shows the circuit used to control the scanning lamp intensity with the following functions:

1) Turns on and off the scanning lamp.
2) Checks if the scanning lamp is on or not.
3) Controls the scanning lamp intensity, i.e., keeping the intensity constant against fluctuations in the supply voltage.

## 2. Operation

### a. Turning On and Off the Scanning Lamp

When LAON=0, the lamp regulator drive circuit turns off, causing the intensity control circuit to turn off and the scanning lamp (LA1) to turn off.

When LAON=1, the lamp regulator drive circuit turns on, causing the intensity control circuit to turn on and the scanning lamp (LA1) to turn on.

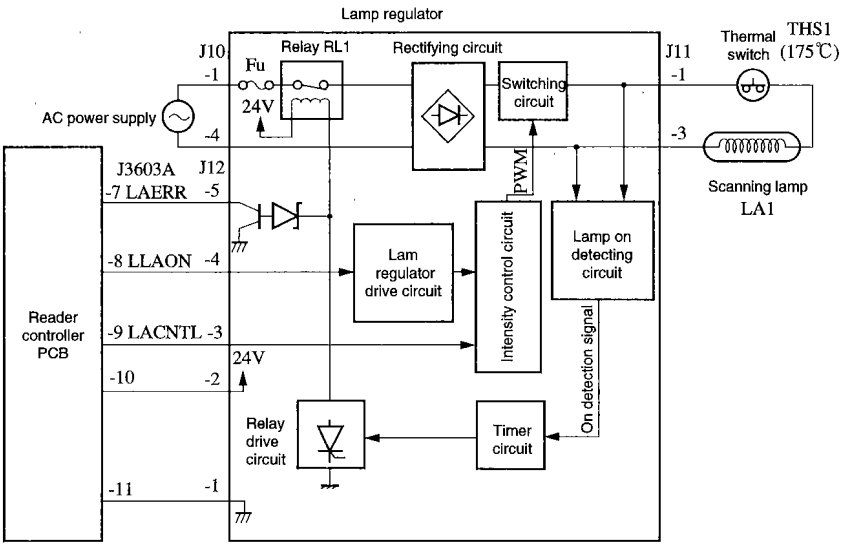


Figure 3-208

**b. Detecting the Activation of the Scanning Lamp**

As long as the scanning lamp (LA1) is on, the lamp on detecting circuit remains on to send the on detection signal to the timer circuit.

If, for some error, the scanning lamp remains on for about 60 sec, the timer circuit activates the relay drive circuit to turn on the relay (RL1); the condition cuts off the AC input, thereby turning off the scanning lamp and, at the same time, sending the lamp error signal (LAERR) to the reader controller PCB. As a result, 'E220' is indicated on the control panel.

When the relay has been turned on, you may reset the copier by turning the power switch off and then on.

The copier is provided with the following two protection mechanisms to prevent the wrong activation of the scanning lamp:

- If the temperature inside the thermal switch exceeds 175°C, the thermal switch turns off to cut off the power to the scanning lamp.
- If an overcurrent flows because of a short circuit around the scanning lamp, the fuse turns off to cut off the supply power to the lamp regulator.

**Caution:**

The thermal switch (THS1) is used on a DC line, and its contact is subject to damage upon activation. Do not reuse the switch, or its activation after recovery may fail the mechanism.

**c. Controlling the Scanning Lamp Intensity**

The scanning lamp intensity is determined by the value of the intensity adjustment signal (LACNTL) sent by the reader controller PCB.

The intensity control circuit of the lamp regulator generates pulse signals (PWM) that suit the LACNTL signal to the switch circuit, and the switch circuit turns on and off at short intervals.

Varying the on/off intervals, the current supplied to the scanning lamp is controlled, thereby ultimately controlling the intensity.

The value of the LACNTL signal is determined when 'CCD' under 'FUNCTION' is executed in service mode; thereafter, the value remains the same. You must execute 'CCD' under 'FUNCTION' in service mode whenever you have replaced the scanning lamp or reader controller PCB.


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# III. IMAGE PROCESSING SYSTEM

## A. Outline

The image processing system consists of the CCD, CCD driver PCB, analog processor PCB, and image processor PCB, and serves to convert optical images from the original exposure system into electrical signals, corrects and processes them, and sends them to the laser exposure system.

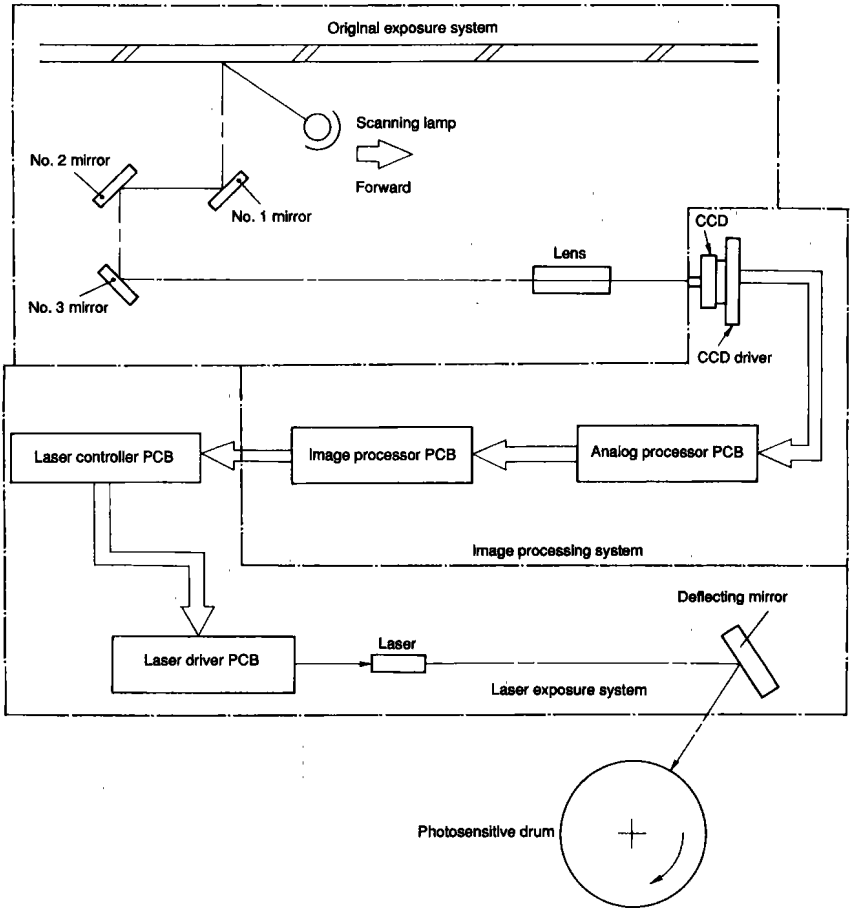


Figure 3-301

# B. CCD/CCD Driver

## 1. CCD

The CCD (charge-coupled device) used in the copier consists of three lines of about 5,000 photocells, and each CCD line is covered by a B, G, or R filter.

In addition, each CCD line consists of a transfer unit and output unit; the outputs from the odd-number light-receiving units and the even-number light-receiving units are generated by the output unit A and output unit B, respectively. In other words, the CCD lines used in the copier simultaneously generate six channels of image signals.

## 2. CCD Driver

The image signals generated by the CCD are sent through a buffer (lower impedance transforming circuit) to assume a low impedance and sent to the analog processor PCB.

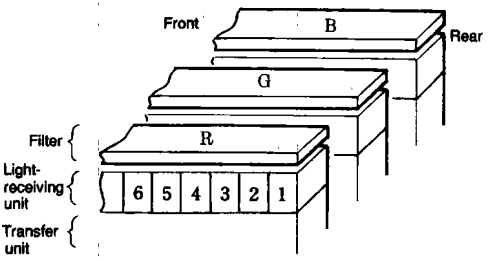


Figure 3-302

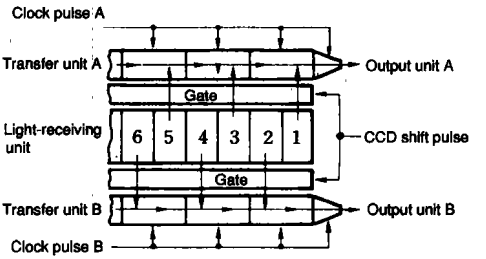


Figure 3-303

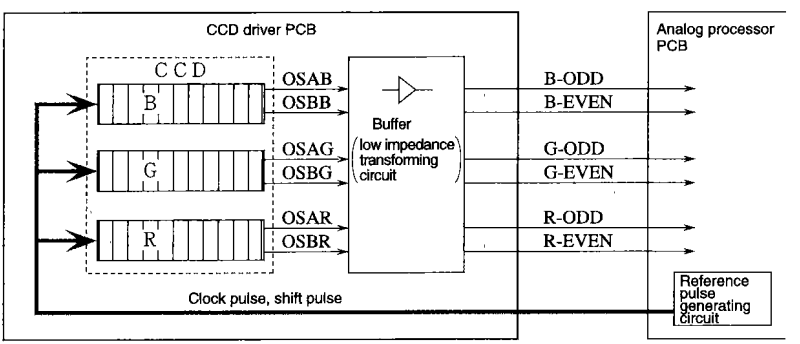


Figure 3-304


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## C. Analog Image Processing

The circuit processes the output of the CCD for the following:

- Odd/even bit synthesis
- BGR level matching
- A/D conversion

The six channels of image signals (odd/even bit, independent) is sample-held by the sample hold signal (SH), and synthesized into image signals of three channels (BGR) according to the select signal (SEL).

Then, BGR level-matching is executed according to the BGR gain signal and BGR offset signal for correction of the photoconversion efficiency of each CCD (B, G, R).

The A/D converting circuit operates in relation to the ADCLK signal, and converts the BGR image signals into digital signals (8 bits each) for the image processor PCB.

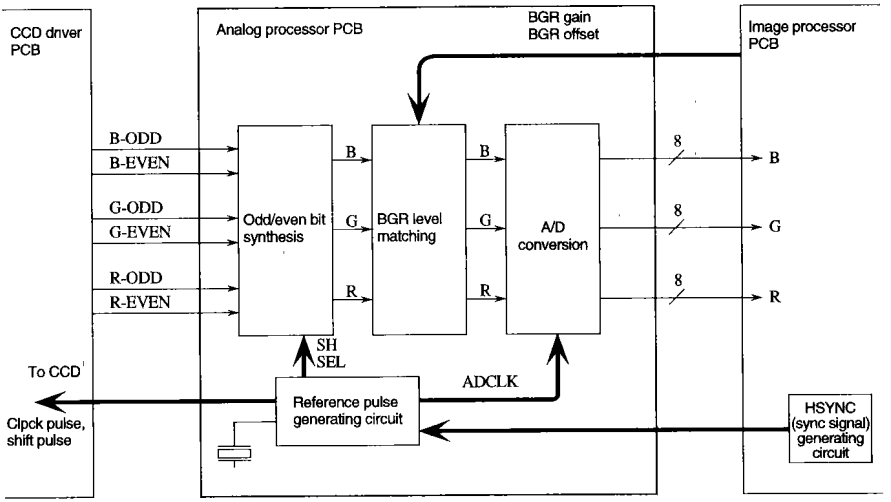


**Figure 3-305**

# D. Digital Image Processing

## 1. Outline

The copier performs digital image processing using the PCBs shown in Table 3-301, which are collectively called the image processor.

The BGR image signals sent by the analog image processing system are converted into YMCBk image signals in the digital image processing system.

Each specific conversion of individual data items is also executed for the appropriate image processing specified on the control panel. The image data upon conversion will be 8-bit image signals ready for transmission to the printer unit.

| PCB | Description | CLC700 | CLC800 |
|---|---|---|---|
| IP-MOTHER | Bus for the IP PCBs. | ○ | ○ |
| IP-MAIN<br><br>IP-KM<br>(TYPE1 only) | Shading correction, 3-line position matching, color correction, original size detection, color property compression, logarithmic correction, coloring, outline processing, density correction, reproduction ratio/slant processing, harness/filter processing, anti-counterfeit processing, black text generation/processing (black extraction, line width detection, edge detection) | ○ | ○ |
| IP-ECO | Assists IP-MAIN. | ○ | ○ |
| IP-ED | Interface between copier and external devices, editing based on input signals from editor (color conversion, texture processing) | □ | □ |
| IP-IF | Interface between copier and external devices | Δ | X |
| IP-PRJ | Projector auto focusing, shading correction, color correction, and mirror image processing when projector is in use | Δ | Δ |

**Table 3-301**

- ○ comes as standard; Δ is available as an option; X is not accommodated; □ available as option for certain models.
- For the CLC700, either IP-IF PCB or IP-ED PCB may be installed as an option.


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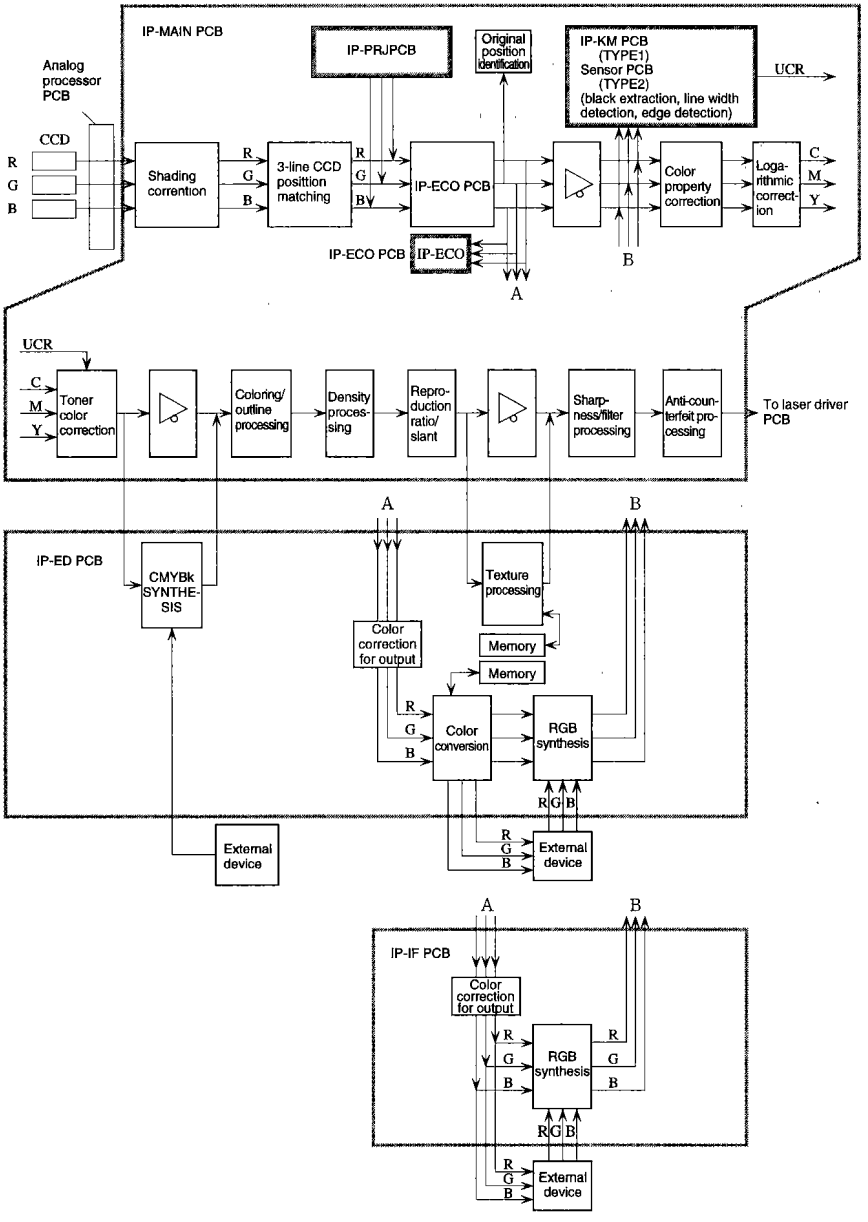
IP-MAIN PCB
Analog processor PCB
CCD
R
G
B
Shading correntionn
3-line CCD posittion matching
IP-PRJPCB
Original position identification
IP-KM PCB
(TYPE1)
Sensor PCB
(TYPE2)
(black extraction, line width detection, edge detection)
UCR
IP-ECO PCB
IP-ECO
Color property correction
Loga-rithmic correct-ion
C
M
Y
A
B
UCR
Toner color correction
Coloring/ outline processing
Density proces-sing
Repro-duction ratio/ slant
Sharp-ness/filter processing
Anti-coun-terfeit pro-cessing
To laser driver PCB
IP-ED PCB
CMYBk SYNTHE-SIS
Texture processing
Color correction for output
Memory
Memory
Color conversion
RGB synthesis
External device
External device
IP-IF PCB
Color correction for output
RGB synthesis
External device

**Figure 3-306**

## 2. Shading Correction

The output of the CCD will not necessarily be uniform even if light is reflected by an original whose density is uniform for the following factors:

- The CCD's pixels may have different sensitivities.
- The transmission characteristic of the lens differs between its center and the peripheral areas.
- The scanning lamp is subject to deterioration.

Shading correction is performed for the purpose of correcting these factors.

a. The CCD reads the bar code found beneath neath the standard white plate.

**Reference 1**

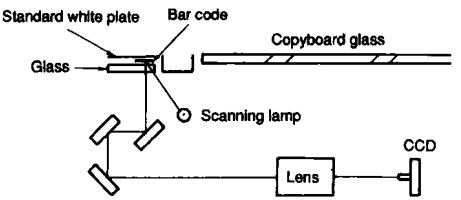


**Figure 3-307**

b. The CCD measures the intensity of the light reflected by the standard white plate, and generates data that represents the light.

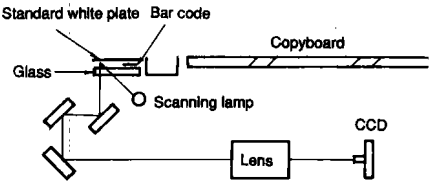


**Figure 3-308**

c. The shading correction circuit compares the measurement data of b. against the target value determined in a., and memorizes the difference as the shading correction value.

The shading correction value is used to correct data obtained during scans, and these measurements are taken each time the Copy Start key is pressed.

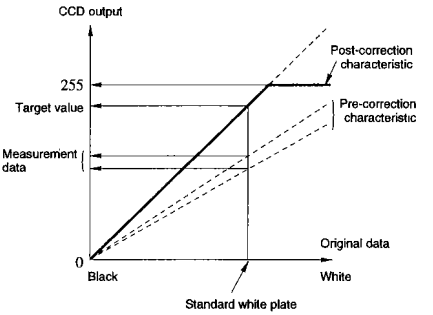


**Figure 3-309**


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**Reference:**

1. A bar code is attached to the copier's standard white plate to represent the light (B, G, R) reflected by each standard white plate; measurements are taken at the factory and converted into bar code notation.
2. The color balance for light areas may be adjusted by 'OFST' under 'COL-ADJ'.
3. If the density or color balance cannot be adjusted by the base film when making copies of negative film, it is a good idea to adjust 'NEGA' under 'SH-TRGT'.
4. Scratches or dirt on the standard white plate increases shading correction for the corresponding areas, causing vertical white lines on copies.
   If lines persist after cleaning the standard white plate, you may change the position of shading correction by 'ADJ-S' under 'ADJ-XY' in service mode.

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## 3. 3-Line CCD Position Matching

The copier's CCD is really three CCDs each covered by any of the R, G, and B filters, and the line image generated by each CCD at a specific point has a discrepancy of about 0.5 mm (for 8 lines) in relation to the copyboard glass.

This discrepancy is corrected by storing the R and G image signals temporarily in the line memory and generating them after synchronizing them with the B image signal.

**Reference:**

The delay in the B image signal is at its maximum when 400% enlargement is made; at this time, the R image signal is delayed for 64 lines, and the G image signal is delayed for 32 lines.

For example, when 320% enlargement is made, the R image signal must be delayed for 51.2 lines; here, the following correction is made using data representing adjacent pixels:

image data representing the 51.2 line = 0.8 x (pixel data representing the 51st line) + 0.2 x (pixel data representing the 52nd line).

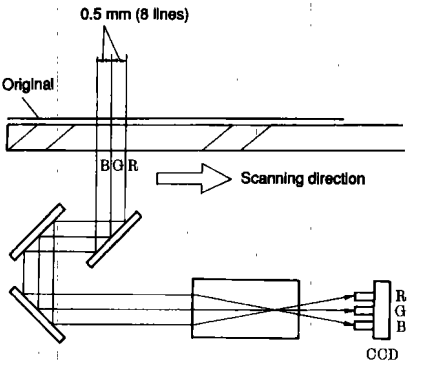


Figure 3-310

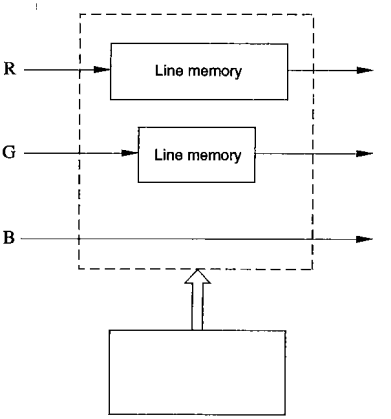


Figure 3-311


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## 4. Sensor Color Correction Block

The sensor color correction block refers to the circuit that corrects the transmission characteristic of the B, G, and R filter of the CCD.

Each filter would be ideal if it transmitted light of a specific wavelength and reflected light of other wave lengths; since this is not the case and the filters transmit unwanted light as well, a special circuit is needed for correction.

For instance, a G filter would be ideal if it let pass 100% of light of 500 nm to 600 nm in length (green) and blocked light 500 nm or less and 600 nm or more in length.

In reality, light of a length indicated as *a* and *c* of Figure 3-312 passes through the filter while light of a length represented by *b* is blocked.

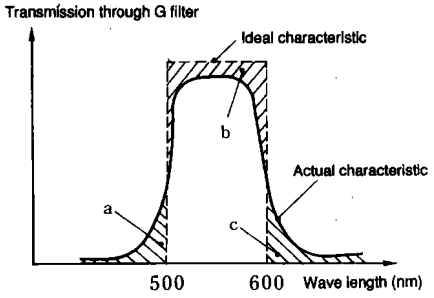


**Figure 3-312**

To correct the actual characteristic so that it is made as close to the ideal characteristic as possible, the following computations are made:

$$\begin{bmatrix} Rout \\ Gout \\ Bout \end{bmatrix} = \begin{bmatrix} a_{11} \\ a_{21} \\ a_{31} \end{bmatrix} \begin{bmatrix} a_{12} \\ a_{22} \\ a_{32} \end{bmatrix} \begin{bmatrix} a_{13} \\ a_{23} \\ a_{33} \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

- RGB : input signal to color correction circuit.
- Rout, Gout, Bout : output signals from color correction circuit
- a11 through a33 : correction coefficient

## 5. Original Position Identification

The term original position identification refers to finding out the location and size of the original on the copyboard.

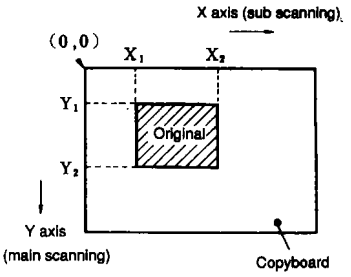


**Figure 3-313**

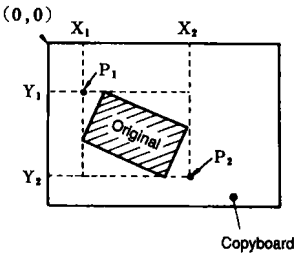


**Figure 3-314**

Figure 3-313 shows when a rectangular original is placed on the copyboard in relation to the X (sub scanning) and Y (main scanning) axis of the copyboard; Figure 3-314 shows when an original is placed at a slant.

The bottom of the copyboard cover is mirror-finished, i.e., unlike the copyboard cover of a conventional copier, it is not white or does not refract light; this way, the area covered by an original will reflect the light of the scanning lamp to the CCD.

- Area Covered by an Original

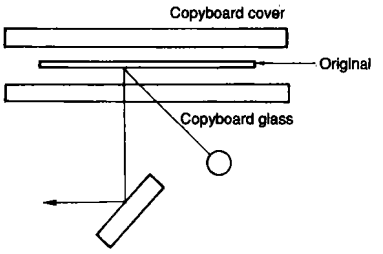


**Figure 3-315**

- Area Not Covered by an Original

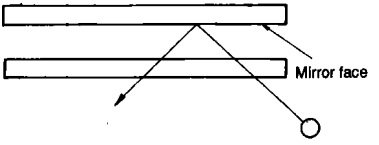


**Figure 3-316**

Most paper used as originals tends to be white so that the white area as detected during a scan may be identified as representing the area of the original.

In other words, a rectangle formed with a diagonal line running between coordinates Xmin/Ymin and Xmax/Ymax may be assumed to represent the original.

Placement of an original as shown in Figure 3-314, for this reason, will result in the copier's identifying the original as being of a size formed by P1 and P2.

**Reference:**

1. Xmin: ....stores the coordinates representing the change from first black to white.
2. Xmax: ...stores the coordinates representing the change from the last white to black.
3. Ymin: ....stores the coordinates closest to the point where the main scan started, while noting a change from black to white.
4. Ymax: ...stores the coordinates farthest from the point where the main scan started noting a change from white to black.

By automatically identifying the position and size of an original this way, automatic selection of a reproduction ratio or paper and image shifting become possible.

**Caution:**

Document position identification is not possible if an original is placed on the copyboard glass with an RF installed.


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## 6. Black Extraction and Edge/Line Width Extraction

### a. Outline

The copier's digital image processing block includes the IP-KM PCB, and performs the following image processing based on the BGR signals from the IP-MAIN PCB:

- black extraction
- edge extraction
- line width extraction

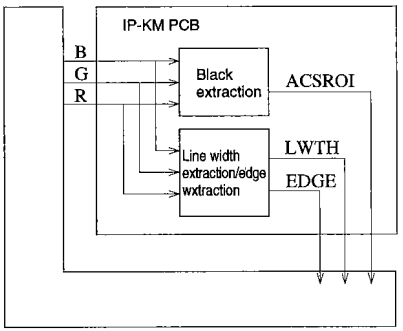


**Figure 3-317**

The black detection signal (ACSROI) generated by the IP-KM PCB helps the IP-MAIN PCB to generate the UCR signal. In addition, the IP-MAIN PCB uses three signals (ACSROI, EDGE, LWTH) to perform black text identification, sharpness processing level identification, laser line number switching (200/400 lines), and black original detection (ACS).

### b. Black Extraction

Based on the BGR signal from the IP-MAIN PCB, the copier determines the pixel input representing either black or a color, and sends the result to the IP-MAIN PCB.

- BGR Input Identified as Black

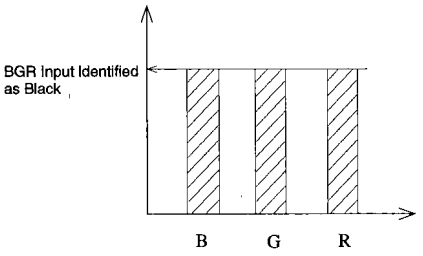


**Figure 3-318**

- BGR Input Identified as a Color

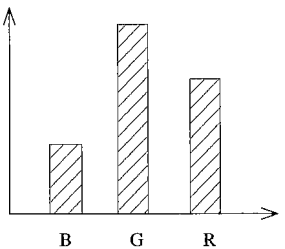


**Figure 3-319**

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**c. Edge Detection/Line Width Detection**

In the edge detection/line width detection block, the BGR signal from the IP-MAIN PCB is used to generate the intensity signal representing each pixel; the intensity signals of multiple pixels surrounding the pixel in question are compared against this intensity signal.The changing number of pixels selected from among the adjacent pixels is used to determine whether the pixel in question is part of the edge of the input image; if so, the line width of the edge is also identified. When an edge is identified, the edge signal (EDGE) and line width signal (LWTH) are sent to the IP-MAIN PCB.

**Reference:**

The black original detection signal (ACS) is generated based on the black detection signal (ACSROI) that is generated during pre-scanning.

## 7. Color Property Correction

The range of color reproduction of the images generated by a photo original or computer is often greater than the printer unit's ability to reproduce color.

As shown in Figure 3-320, the conventional method enables the reproduction of original colors (points a and b) that are within the printer unit's color reproduction ability; however, since data representing a color (point c) outside the printer unit's color reproduction ability is not reproduced faithfully, there are bound to be discrepancies between the original and output images in terms of gradation.

The copier is designed so that it is aware of its printer unit's ability to reproduce color properties (tint, brightness, chroma). By determining the color properties of the original based on the RGB data it reads during pre-scanning, it converts the data to ensure that the data will be processed by its printer unit in such a way that it reproduces the colors as close to those of the original, reproducing the gradation of the original better than conventional copiers.


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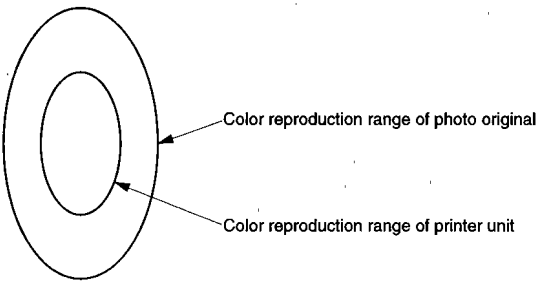
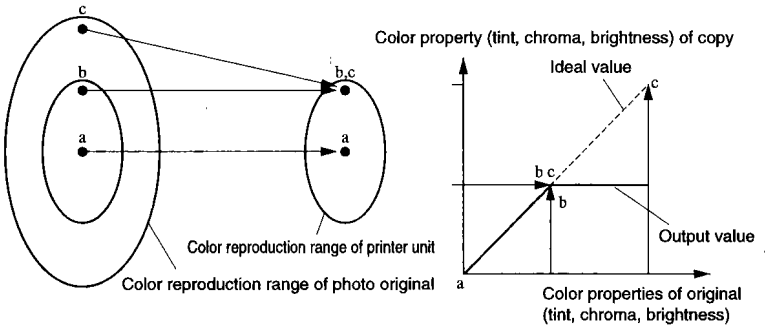



- Conventional Method




- CLC700/800

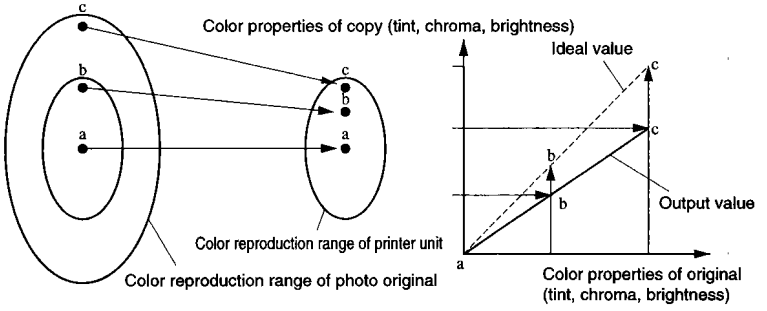



**Figure 3-320**

## 8. Logarithmic Correction and BGR-to-YMC Conversion

### a. Logarithmic Conversion

The output from the CCD has a linear characteristic in relation to the intensity of light reflected by an original; however, the density of an original as perceived by the eye is not linear.

Figure 3-321 shows the relationship between the density of an original as perceived by the eye and the output of the CCD.

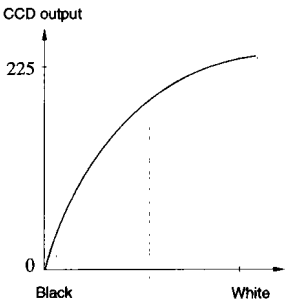



**Figure 3-321**

To correct the discrepancy, level conversion is performed; see Figure 3-322.

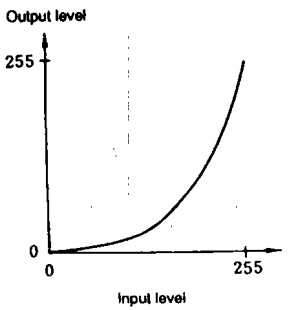



**Figure 3-322**

### b. BGR-to-YMC Conversion

The circuit generates YMC signals taking advantage of the complementary relationship between the BGR lights and YMC toners.

| Toner / Light | Y | M | C |
|---|---|---|---|
| B | Absorption | Reflection | Reflection |
| G | Reflection | Absorption | Reflection |
| R | Reflection | Reflection | Absorption |

**Table 3-302**

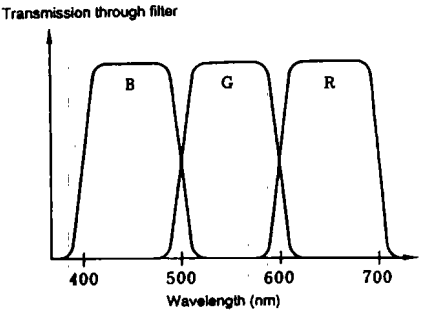



**Figure 3-323**

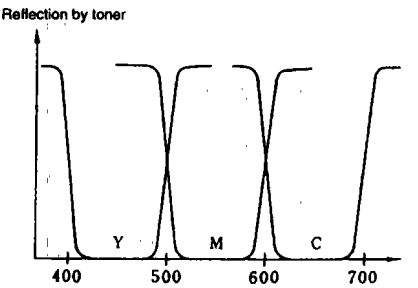



**Figure 3-324**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The transmission through each of the CCD filters (B, G, R) and the density of the original (Y, M, C) are complementary; level conversion is performed as in Figure 3-325 to generate each of the Y, M, and C signals.

BGR-to-YMC Conversion

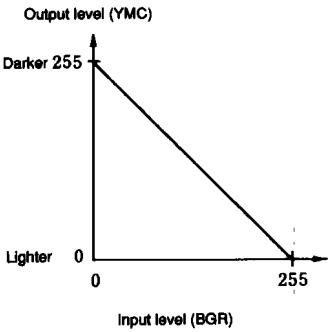


**Figure 3-325**

**Reference:**
Y=B, M=G, C=R

## 9. Toner Color Correction

The toner color correction block generates the Bk signal using the UCR signal from I_-KM PCB and, at the same time, corrects the reflection characteristic of each toner for the printer unit.

For instance, the M toner ideally should absorb 100% of light which is 500 nm to 600 nm in wave length (green) and reflects all light with light wave lengths of 500 nm or less and 600 nm or more; in reality, however, areas represented by a, b, and c in Figure 2-326 exist.

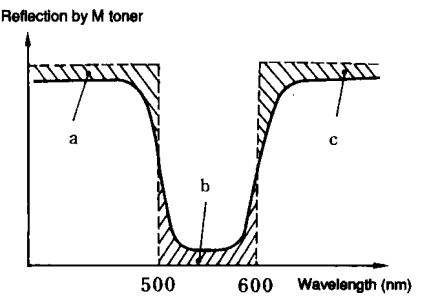


**Figure 2-326**

Color correction is performed to compensate for such a discrepancy.

## 10. Coloring/Outline Processing

The coloring/outline processing block processes/modifies image data according to the color and are specified on the control panel or by the editor. A specified area is divided into a text area and background (without image data); a text area, further, is divided into a text area, character outline area, and shade area, all of which are generated by the IP-ED PCB. Each of these areas are then subjected to image data processing/modification.

- Painting
  The specified area is painted with a speci fied color.
- User Coloring
  The image data for the specified area is converted to represent a specified color.
- Gradation
  Within the specified area, the ratio of two specified colors is varied for painting.
- Color Filtering
  Within the specified area, a fixed synthesis ratio is used to synthesize the colors represented by image data and specified colors.

## 11. Density Processing

The correction curve for the density processing is varied according to the settings of the following:

a. Copy Density key on the control panel
b. Color balance on the control panel
c. Color balance in service mode (COL-ADJ)
d. Light area offset adjustment in service mode (OFST of COL-ADJ)
e. Text/photo mode

According to items from a to d above, a darker or lighter curve is used as shown in Figure 3-327.

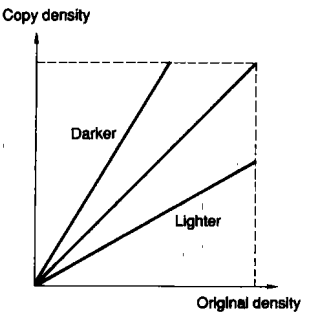


**Figure 3-327**

If in text mode (item e), a curve which ensures dark text without fogging will be used as in Figure 3-328.

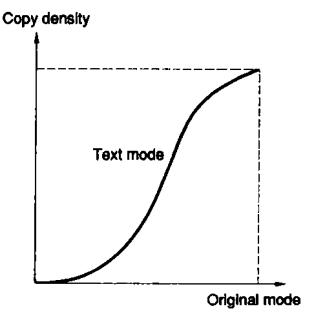


**Figure 3-328**


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## 12. Reproduction Ratio/Shift/Editing Processing

### a. Reproduction Ratio

① Horizontal Ratio (main scanning direction)

When writing image data to memory, data is skipped (reduction); when reading from memory, the same data may be read repeatedly (enlargement).

② Vertical Ratio (sub scanning direction)

The speed at which the scanner moves is varied, thereby changing the scanning width for a single pixel on the original.

Table 3-303 shows how the copier processes reproduction ratios.

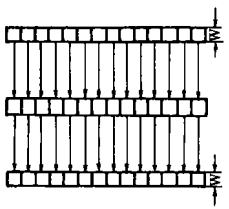
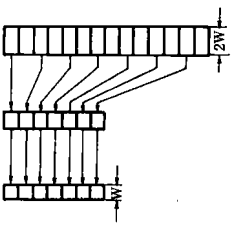
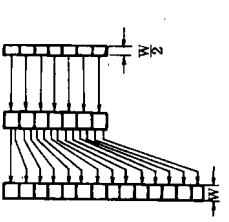
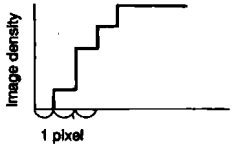
| | DIRECT | REDUCE | ENLARGE |
|---|---|---|---|
| Original (image data)<br>Line memory (reading)<br>Copy |  |  |  |
| Reproduction ratio in main scanning direction | All data is written in memory as it is and read as it is. | To reduce by 50%, every other data unit is written. | To enlarge by 200%, all data is written in memory as it is, but the same data is read twice. |
| Reproduction ratio in sub scanning direction | | The scanner is moved faster to increase the scanning width for a pixel on the original. | The scanner is moved slower to decrease the scanning width of a pixel on the original. |

**Table 3-303**

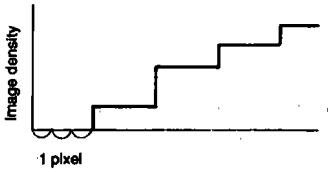
**b. Enlargement Correction**

When enlargement is used, the image data is corrected so that the difference in density between pixels will not vary exceedingly.

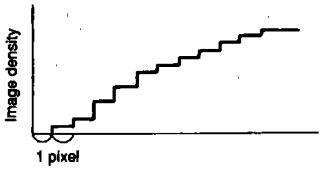
Figure 3-329 shows image data representing an original, image data at time of enlargement, and image data after enlargement correction.




a. Original




b. 300% Enlargement




c. After Enlargement Correction

**Figure 3-329**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**c. Shift**

Figures 3-330, -331, and -332 give an outline of the shift mechanism in both main and sub scanning directions using examples.

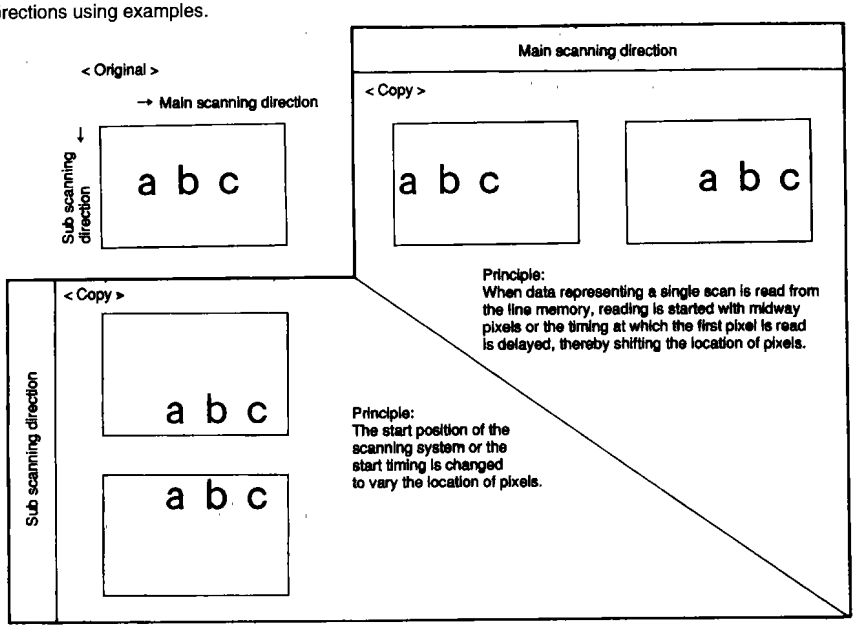
< Original >
→ Main scanning direction
Sub scanning direction
a b c
Main scanning direction
< Copy >
a b c
a b c
Principle:
When data representing a single scan is read from the line memory, reading is started with midway pixels or the timing at which the first pixel is read is delayed, thereby shifting the location of pixels.
< Copy >
Sub scanning direction
a b c
a b c
Principle:
The start position of the scanning system or the start timing is changed to vary the location of pixels.

**Figure 3-330**

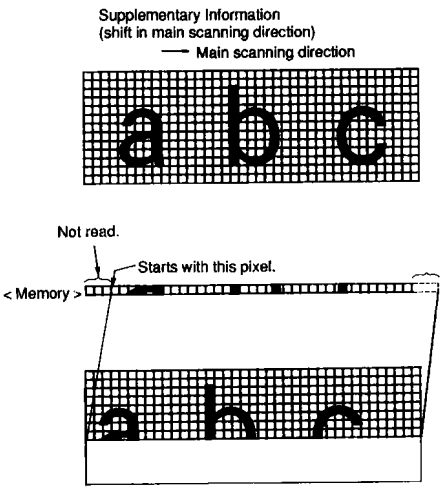


**Figure 3-331**

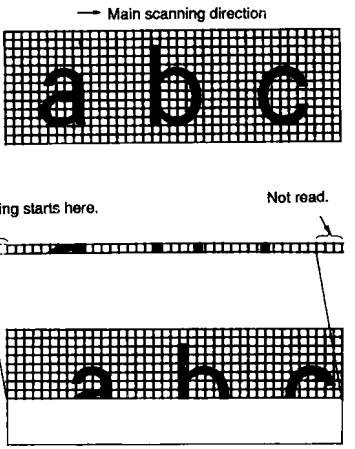


**Figure 3-332**

Combining shifts in the main and sub scanning directions, the following shifts will be possible:

① Center Shift
From the size of the area to be shifted and the size of the copy paper used, coordinates (Xm, Ym) of a rectangle whose top/bottom and left/margins on the copy will be identical are computed, and the area is shifted to the point.

② Left/Right Binding
The entire image is shifted to provide a binding margin.

③ Specified Shift
An area is shifted for a specified distance.

**Reference:**

$$Xm = \frac{Xmax - (X_2 - X_1)}{2}$$

$$Ym = \frac{Ymax - (Y_2 - Y_1)}{2}$$

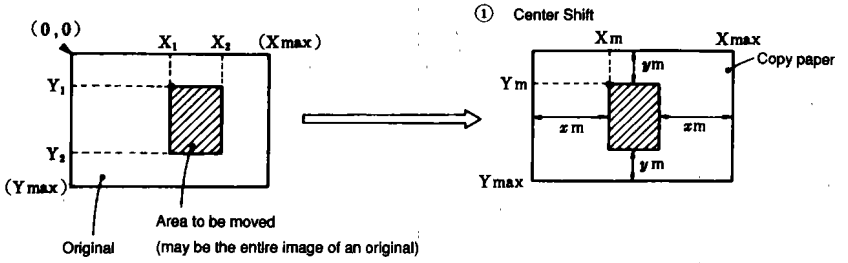


**Figure 3-333 Center Shift**


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### d. Mirror Image

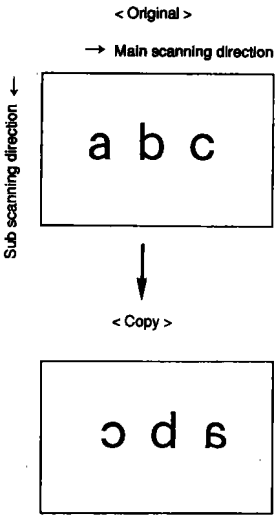


Figure 3-334

Principle

When data representing a single scan is read from RAM, reading is executed in reversed order, thereby creating a mirror image in relation to the main scanning direction.

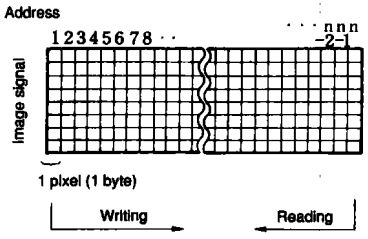


Figure 3-335

### e. Image Repeat

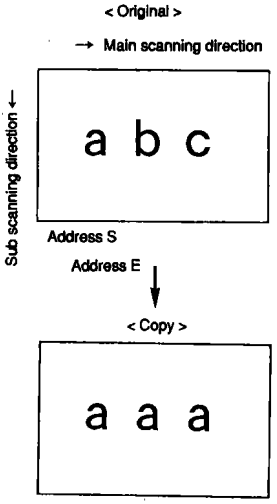


Figure 3-336

Principle

When reading data representing a single line is read from RAM, the starting address (address S) and the ending address (address E) are specified; then, reading is started with address S and, when address E is reached, reading is resumed starting with address S once again. An image may be duplicated by repeating this operation.

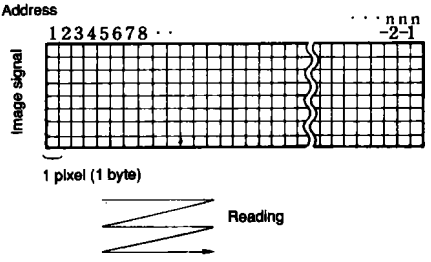


Figure 3-337

## 13. Sharpness/Filter Processing

In this processing, computations are made to create sharp or soft images according to the settings of the selected copy mode or in sharpness mode.

Figure 3-339 shows the output level of image data whose input is shown in Figure 3-338 with 'Sharpness Weak' selected.

In 'Sharpness Weak', the changes in the density of the image are smoothed out to produce a soft image.

Figure 3-340 shows the output level when 'Sharpness Strong' is selected.

In 'Sharpness Strong', the changes in the density of the image is emphasized to produce a sharp image.

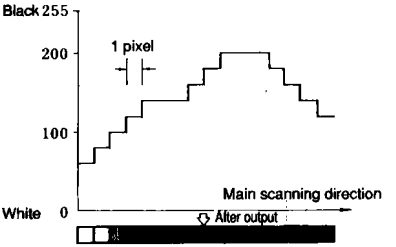


**Figure 3-338 Input Level**

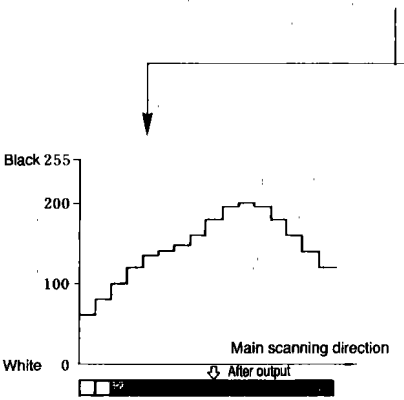


**Figure 3-339 Sharpness Weak**

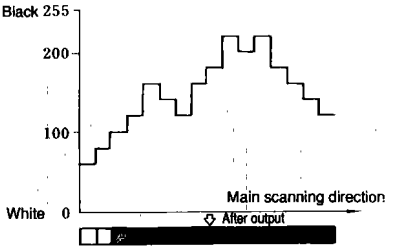


**Figure 3-340 Sharpness Strong**


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## 14. CMYBk/RGB Synthesis

The CMYBk synthesis block and RGB synthesis block perform the following processing according to instructions from the control panel and editor:

- Transparent synthesis
- Gradation processing

CMBk or RGB image data from an external device (IPU) and CMYBk or RGB image data are synthesized based on the ratio specified by the control panel or editor.

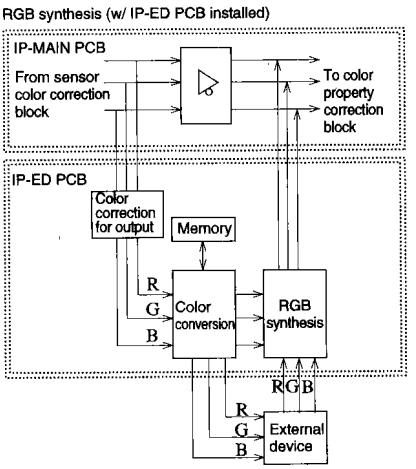


Figure 3-341

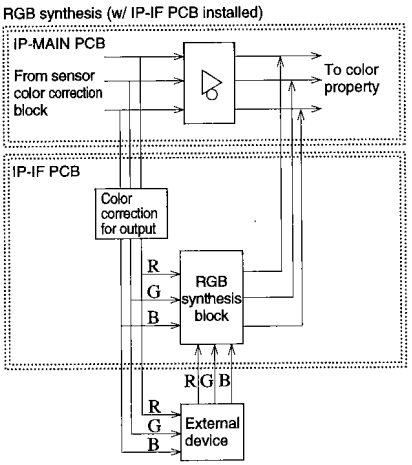


Figure 3-342

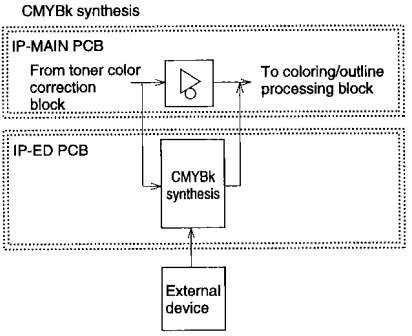


Figure 3-343

## 15. Texture Processing

Image data read during pre-scanning is stored according to the instructions from the control panel and is read during original image processing.

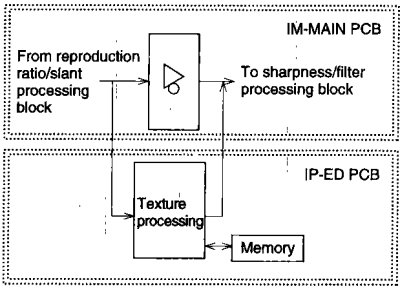


**Figure 3-344**

## 16. Color Conversion

The color conversion block performs the following processing according to instructions sent from the control panel or editor:

- Color conversion
- Posterization
- Solarization

In the color conversion block, the RGB data that has been read is converted to color property data (tint, chroma, brightness), which will then be processed for the above; thereafter, the color property data is further converted to RGB data for transmission to the next step.

When sending images read from the scanner unit to an external device, image data is sent out by the color conversion block.


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# IV. LASER EXPOSURE SYSTEM

## A. Outline of the Laser Exposure System

The laser exposure system consists of a laser unit, which is the source of laser beams, and a laser scanner which is equipped with an 8-facet mirror used to scan the photosensitive drum with a laser beam.

The video signals (VDO-0 through -7) from the image processor PCB are converted into laser intensity signals (LD) on the laser driver PCB, and the semiconductor laser inside the laser unit generates a laser beam according to these laser intensity signals.

The laser beam is then turned into a parallel beam having an oval cross section by a collimator lens; thereafter, it is corrected to assume a band shape by means of a cylindrical lens.

The laser beam is reflected by the 8-facet mirror rotating at a specific high speed, and directed to the photosensitive drum through imaging lenses.

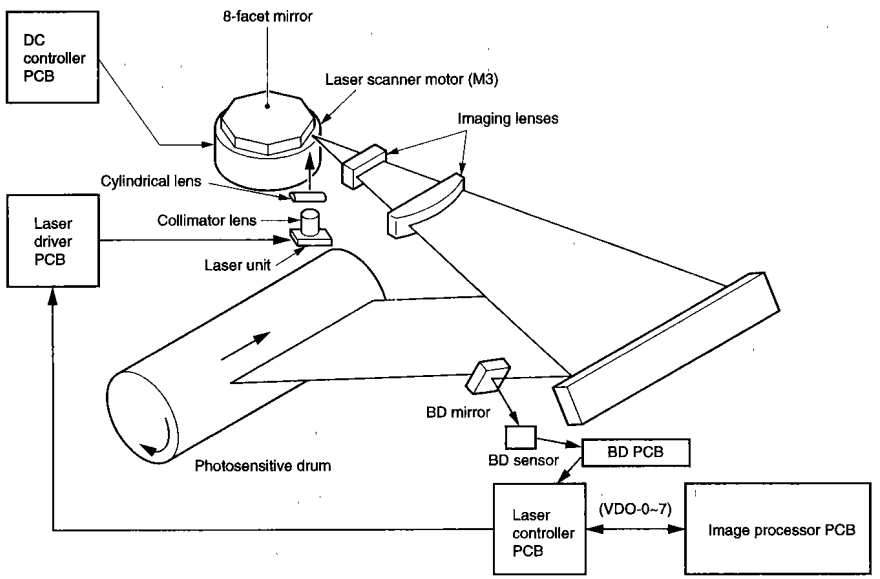


**Figure 3-401**

## B. Timing Chart for the Laser Exposure System

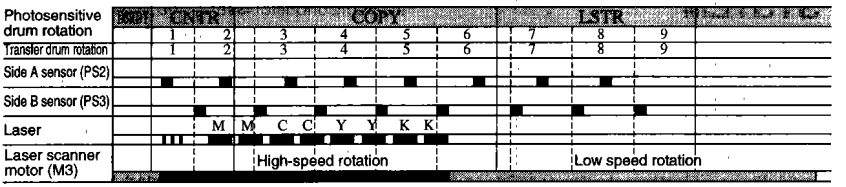


**Figure 3-402 A4/LTR, 2 copies, 4-color, DIRECT, cassette 1**

## C. BD Signal Synthesis

The BD signal used to synchronize the video signals for the main scanning direction is generated in the beam detection signal generator circuit based on the laser beam reflected by the BD mirror found in the optical path of the laser beam.

Using the BD signal, the image processor PCB reads image signals from the CCD, performs image processing, and sends digital video signals to the laser controller PCB.

The digital video signals are converted into analog video signals on the laser controller PCB, and the laser driver PCB generates laser intensity control signals in sequence to represent these analog video signals.

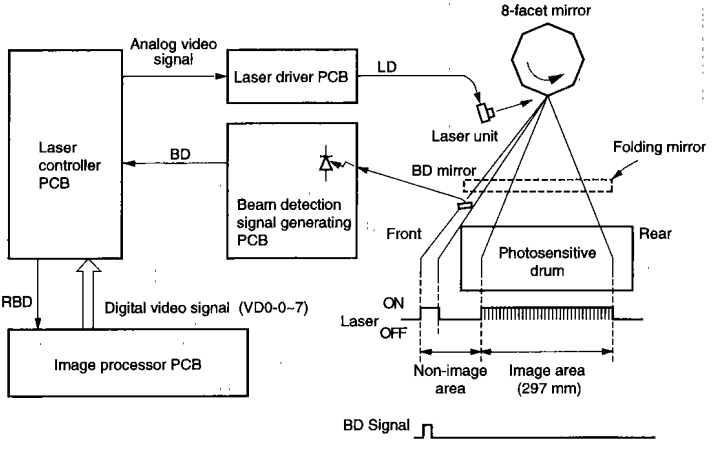


**Figure 3-403**

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## D. Laser Driver Circuit

Figure 3-404 shows the circuit that generates the laser intensity control signals based on the video signals (VDO-0 through VDO-7) from the image processor PCB to drive the semiconductor laser.

Using the 8-bit video signals, clock signals (VCLK), and sync signals (PVE) from the image processor PCB and the image leading edge signal (ITOP) from the DC controller PCB, the laser controller PCB generates the laser drive signal (L-OUT) for transmission to the laser driver circuit.

In addition, the switch signal (PH/TX) is selected by switching between text and photo to suit the selected copy mode for the main scanning direction (400 dpi for sub scanning direction).

When a test pattern is generated in service mode, the DC controller PCB sends an output command to the laser controller, where the test pattern is generated for output.

The laser controller PCB sends the auto output control signal (APCHLD) to the constant current circuit of the laser driver PCB to ensure stable laser output.

For making adjustments using VR951 through VR956, see the Service Handbook.

**Reference:**

L-ON (laser force on signal):
goes '1' (laser on) during laser power adjustment or when printing a test print of horizontal bands.

L-OFF (laser force off signal):
goes '1' when the front door is open (laser off).

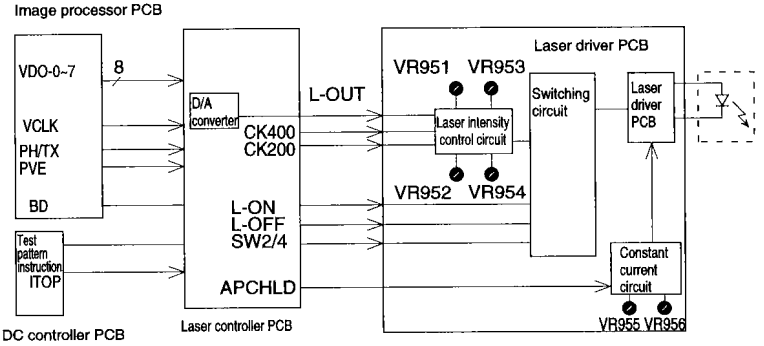


**Figure 3-404**

## F. Laser Scanner Motor

The laser scanner motor (M3) is a brushless DC motor with a built-in rotation speed control circuit. When the DC controller PCB causes the laser scanner motor drive signal (M3ON*) to go '0', the motor rotates at a specific speed.

During standby, the idle operation signal (M3IDL) is caused to go '0' to initiate low-speed operation.

If the rotation speed of the motor deviates for some error, the laser scanner motor ready signal (M3RDY*) goes '1' and the DC controller PCB indicates 'E110' on the control panel.

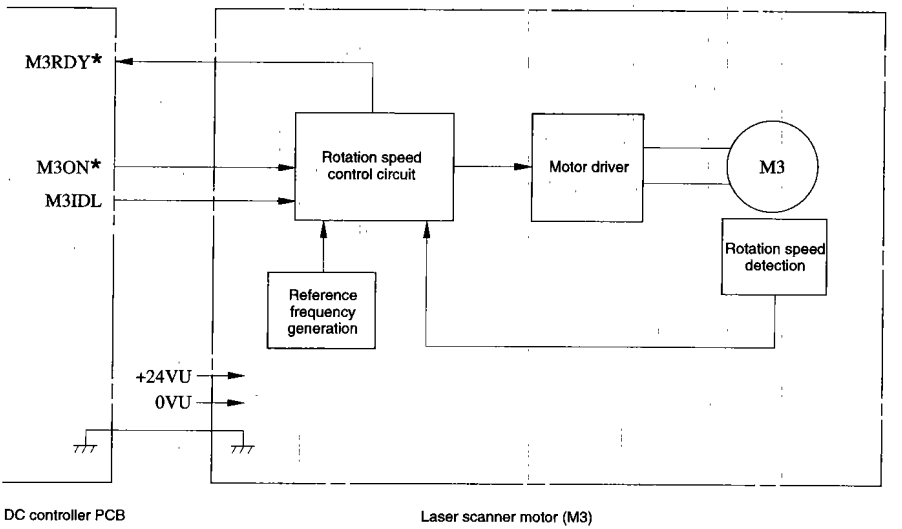


**Figure 3-405**


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# V. IMAGE FORMATION SYSTEM

## A. Outline

The functional construction of the copier's image formation system is as follows:

- Drum surface potential control
  Primary corona assembly grid bias control
  Developing bias control
- Drum toner density control
  Target contrast potential setting
  Gradation correction
- Primary corona ON/OFF
- Attraction brush current control
- Transfer brush current control
- Separation corona current control
- Internal static eliminator corona ON/OFF
- External static eliminator corona ON/OFF
- Photosensitive drum temperature control
- Primary corona wire cleaning control
- Developing assembly/photosensitive cleaning assembly
  Developing assembly engagement
  Color toner density detection
  Black toner density detection
  Drum toner density measurement
  Toner supply
  Photosensitive drum cleaning

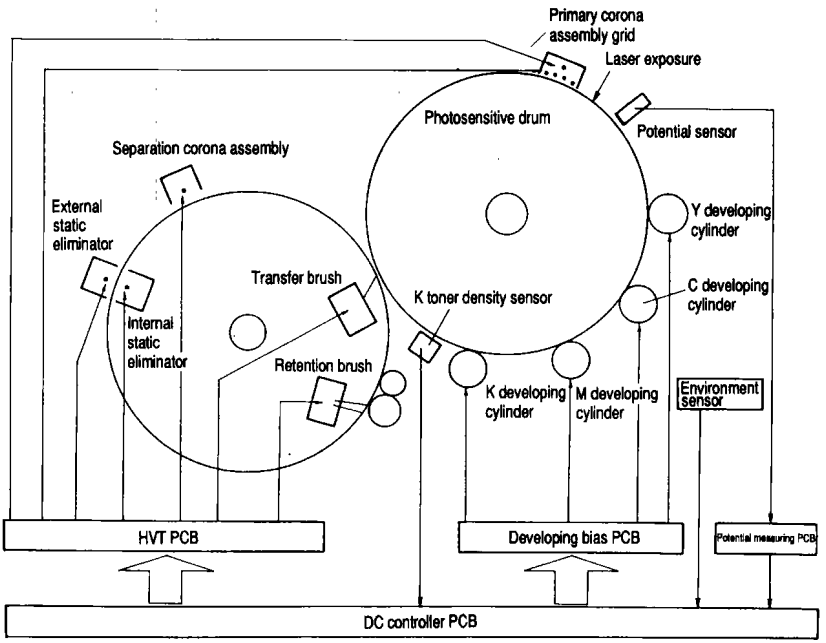


Figure 3-501

# B. Timing Chart for the Image Formation System

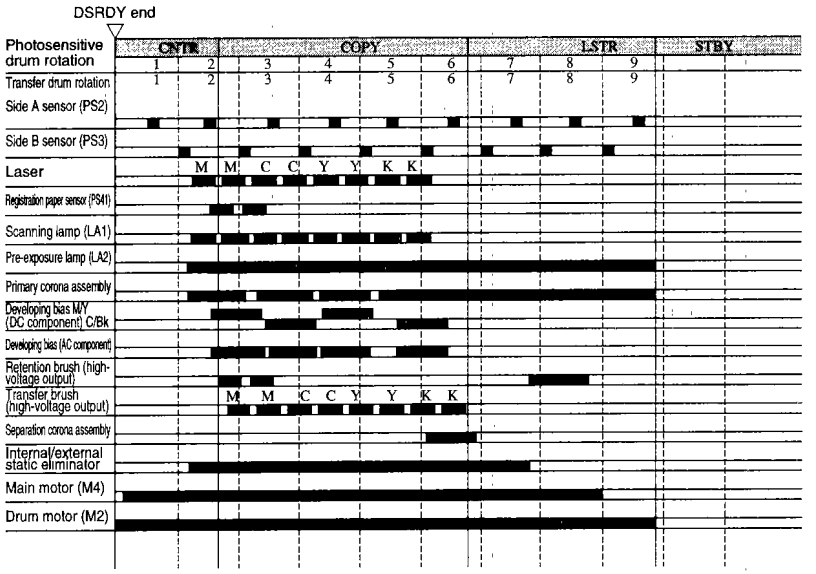


**Figure 3-502 A4/LTR, 2 copies, 4-color, DIRECT, cassette 1**


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## C. Image Stability Control

### 1. Outline

Copy images are subject to changes in the latent static images and development characteristics. Changes in the latent static images are often caused by

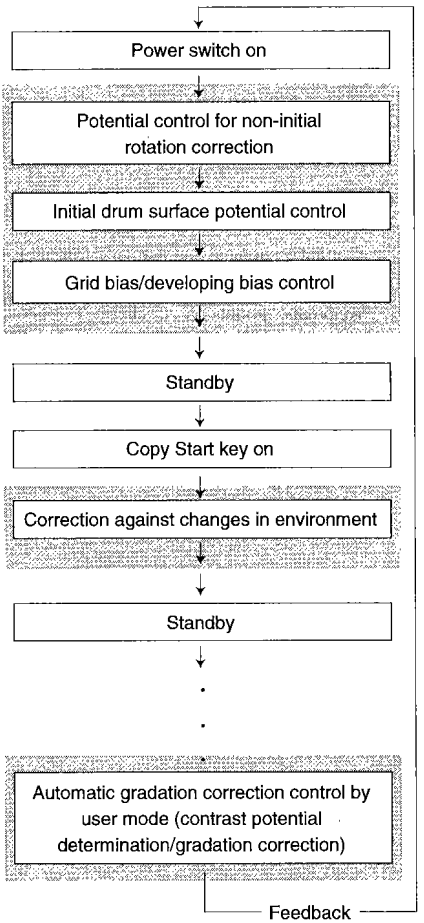
- deterioration in the sensitivity of the photosensitive drum, and
- changes in the discharge from the primary corona assembly.

Changes in the development characteristics, on the other hand, are often caused by

- changes in the toner/developer characteristics triggered by the site environment (temperature, humidity).

To ensure as much stability in the quality of the images in the presence of these factors, the copier is designed to control the grid bias of the primary corona assembly, developing bias, and laser output based on the input signals from the potential sensor and Bk toner density sensor read at time of power-on. In addition, while the copier remains on, the input signals from the environment sensor are used to correct the grid bias of the primary corona assembly and developing bias. In addition, the copier is equipped with an automatic gradation control mechanism that can be accessed in user mode.

See the flow below for an idea of the image stability control mechanism.


Power switch on
Potential control for non-initial rotation correction
Initial drum surface potential control
Grid bias/developing bias control
Standby
Copy Start key on
Correction against changes in environment
Standby
Automatic gradation correction control by user mode (contrast potential determination/gradation correction)
Feedback

| | Control | Sensors | Destination of feedback |
|---|---|---|---|
| 1 | Initial rotation-less correction potential control | Potential sensor | Primary grid bias<br>Developing bias |
| 2 | Initial drum surface potential control | Potential sensor | Primary grid bias<br>Developing bias |
| 3 | Grid bias/developing bias control | Potential sensor | Primary grid bias<br>Developing bias |
| 4 | Correction against changes in environment | Environment sensor | Primary grid bias<br>Developing bias |
| 5 | Automatic gradation correction | ——— | Primary grid bias<br>Developing bias |

**Table 3-501**

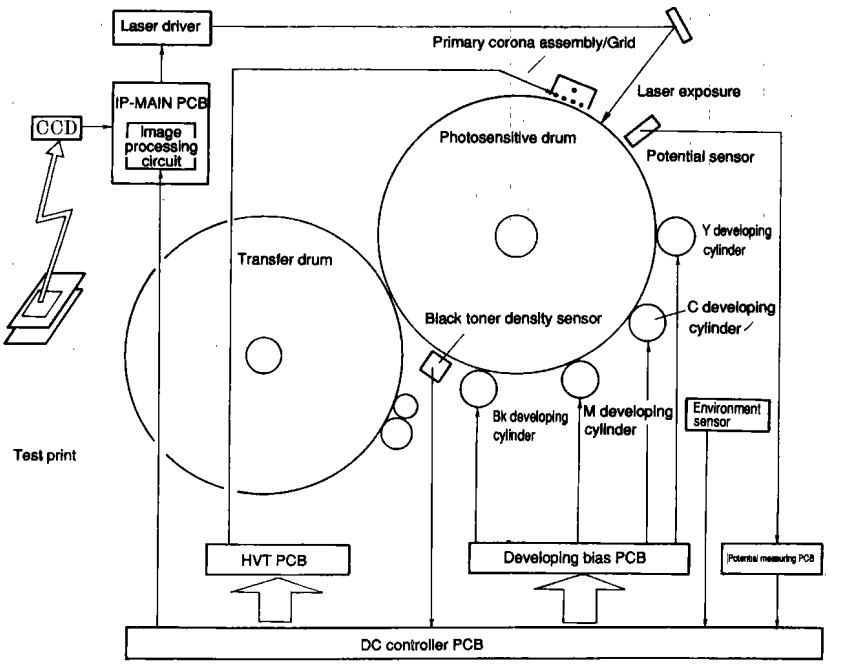



**Figure 3-503**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## 2. Initial Rotation-less Correction Potential Control

### a. Outline

Most conventional copiers execute initial rotation after a press on the Copy Start key to remove the charges from the drum surface and to even out the surface potential before starting copying operation. This copier, on the other hand, starts copying operation without such initial rotation to reduce the first copy time; this, however, is true of only when using cassette 1 as the paper source.

To compensate for the omission of initial rotation, the copier instead executes what is termed initial rotation-less correction potential control, whose data is used when making the first copy (from cassette 1).

For operation and timing, see "3. Controlling Initial Drum Surface Potential."

**Reference:**

Starting copying operation without initial rotation would result in different degrees of density between the first color of the first copy and the first color of the second copy in continuous copying mode caused by the difference in the surface potential occurring during the first rotation of the drum and the second and subsequent rotations.

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## 3. Controlling the Initial Drum Surface Potential

### a. Outline

The copier performs drum surface potential control at time of power-on to control the levels of the grid bias of the primary corona assembly and developing bias.

The copier executes initial drum surface potential control under the following conditions:

- When the temperature of the fixing roller is 110°C or less at power-on.
- Every 2 hr.
- When 'FUNC → EPC' is executed in service mode.

### b. Surface Potential Measurement

The term *surface potential measurement* refers to taking measurements of the dark area potential (Vd) and light area potential ($V_L$) occurring when the grid bias (Vg) of the primary corona assembly is set to the three levels shown in Table 3-502. The potential sensor measures Vd when the laser is turned off and $V_L$ when the laser is turned on.

| (Vg1) | (Vg2) | (Vg3) |
|---|---|---|
| –300 V | –500 V | –700 V |

**Table 3-502**

As shown in Figure 3-505, the grid bias is first set to Vg1, and Vd1/$V_{L1}$ is measured; then, the grid bias is set to Vg2, and Vd2/$V_{L2}$ is measured; and likewise, Vd3/$V_{L3}$ is measured.

Based on the measurements of Vd1 through 3 and $V_{L1}$ through 3, a graph of Vd and $V_L$ like the one shown in Figure 3-504 is prepared.

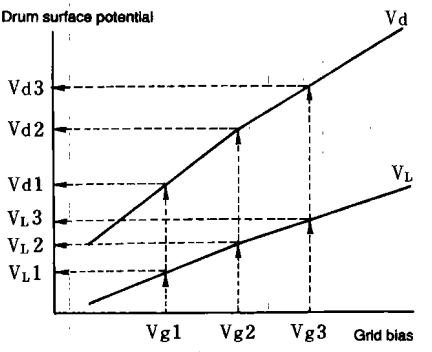


**Figure 3-504**

You can check the data (measurements) on the same screen by executing 'FUNC->EPC' in service mode; see the table for a guide when working in the field:

| | Guide value |
|---|---|
| V00-300V | 280~380 |
| V00-500V | 480~620 |
| V00-700V | 680~860 |
| VFF-300V | 35~145 |
| VFF-500V | 40~190 |
| VFF-700V | 45~235 |

**Table 3-502A**


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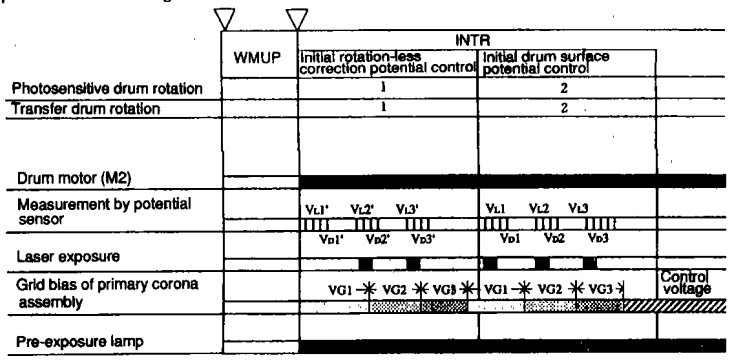
- Sequence of Controlling Initial Drum Surface Potential




$V_{L}1$ through $V_{L}3$ and $V_{D}1'$ through $V_{D}3'$ are used for the first color of the first copy when paper is from the cassette 1.

**Figure 3-505**

**4. 'E061' (associated with drum surface potential control)**

'E061' is an error code used to indicate faults associated with surface potential control.

The machine executes drum surface potential control during multiple initial rotation at power-on. The developing bias and the grid bias for each color are determined based on the measurement taken during the control and the pre-set contrast potential.

Go through the following for descriptions of how drum surface potential control is executed and computations are made, organized in relation to 'E061'.

a. explanation of the drum surface control procedure at power-on
b. explanation of the computation procedure and associated detailed codes

**a. Drum Control Procedure at Power-On**

| Step | Drum rotation | Grid output | Laser output | Surface potential sensor |
|---|---|---|---|---|
| 1 | 1st rotation | Vg1 (–300V) output | laser OFF (V00 output) | measures Vd1' |
| 2 | | | laser ON (VFF output) | measures VL1' |
| 3 | | Vg2 (–500V) output | laser OFF (V00 output) | measures Vd2' |
| 4 | | | laser ON (VFF output) | measures VL2' |
| 5 | | Vg3 (–700V) output | laser OFF (V00 output) | measures Vd3' |
| 6 | | | laser ON (VFF output) | measures VL3' |
| 7 | 2nd rotation | Vg1 (–300V) output | laser OFF (V00 output) | measures Vd1 |
| 8 | | | laser ON (VFF output) | measures VL1 |
| 9 | | Vg2 (–500V) output | laser OFF (V00 output) | measures Vd2 |
| 10 | | | laser ON (VFF output) | measures VL2 |
| 11 | | Vg3 (–700V) output | laser OFF (V00 output) | measures Vd3 |
| 12 | | | laser ON (VFF output) | measures VL3 |
| 13 | Makes computations based on the result of measurement. (See next page.) | | | |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### b. Computation Procedure and Related Detailed Codes

| Step | Description | | Related detailed code | Meaning of detailed code | Possible cause |
|---|---|---|---|---|---|
| 1 | Back-up data check | Potential sensor offset value check. | 0060 | The potential offset value is 80 or less. | The potential sensor is faulty or not adjusted. |
| | | | 0061 | The potential offset value is 120 or more. | |
| 2 | | Measurement check | 0010 | Vd1'/Vd2'/Vd3' is 20V or less. | The primary output is faulty. |
| | | | 0011 | Vd1' is 20V or less. | |
| | | | 0012 | Vd2' is 20V or less. | |
| | | | 0013 | Vd3' is 20V or less. | |
| | | | 0018 | Vd1/Vd2/Vd3 is 20V or less. | |
| | | | 0019 | Vd1 is 20V or less. | |
| | | | 001A | Vd2 is 20V or less. | |
| | | | 001B | Vd3 is 20V or less. | |
| | | | 0020 | Vd1'/Vd2'/Vd3' is 100V or less. | The grid bias output is faulty. |
| | | | 0021 | Vd1' is 100V or less. | |
| | | | 0022 | Vd2' is 100V or less. | |
| | | | 0023 | Vd3' is 100V or less. | |
| | | | 0028 | Vd1/Vd2/Vd3 is 100V or less. | |
| | | | 0029 | Vd1 is 100V or less. | |
| | | | 002A | Vd2 is 100V or less. | |
| | | | 002B | Vd3 is 100V or less. | |
| | | | 0030 | Vd1'/Vd2'/Vd3' is 900V or more. | The grid wire is broken. |
| | | | 0031 | Vd1' is 900V or more. | |
| | | | 0032 | Vd2' is 900V or more. | |
| | | | 0033 | Vd3' is 900V or more. | |
| | | | 0038 | Vd1/Vd2/Vd3 is 900V or more. | |
| | | | 0039 | Vd1 is 900V or more. | |
| | | | 003A | Vd2 is 900V or more. | |
| | | | 003B | Vd3 is 900V or more. | |
| 3 | | Measurement comparison check | 0040 | The difference between Vd1' and Vd2' is 50V or less. | Primary/grid/pre-exposure lamp/poor contact/noise. |
| | | | 0041 | The difference between Vd2' and Vd3' is 50V or less. | |
| | | | 0048 | The difference between Vd1 and Vd2 is 50V or less. | |
| | | | 0049 | The difference between Vd2 and Vd3 is 50V or less. | |
| | | | 0050 | The difference between Vd1' and VL1', between Vd2' and VL2', and between Vd3' and VL3' are all 100V or less. | Laser output fault. |
| | | | 0051 | The difference between Vd1' and VL1' is 50V or less. | |
| | | | 0052 | The difference between Vd2' and VL2' is 80V or less. | |
| | | | 0053 | The difference between Vd3' and VL3' is 100V or less. | |
| | | | 0058 | The difference between Vd1' and VL1', between Vd2' and VL2', and between Vd3' and VL3' are all 100V or less. | |
| | | | 0059 | The difference between Vd1' and VL1' is 50V or less. | |
| | | | 005A | The difference between Vd2' and VL2' is 80V or less. | |
| | | | 005B | The difference between Vd3' and VL3' is 100V or less. | |

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| Step | Description | | Related detailed code | Meaning of detailed code | Possible cause |
|---|---|---|---|---|---|
| 4 | Computation | Computes the grid bias for each color based on the measurement. | xx04 | The grid bias obtained from Vd1' through 3 and VL1' through 3 is 200V or less. | The photosensitive drum has deteriorated, or the laser output is faulty. |
| | | | xx05 | The grid bias obtained from Vd1' through 3 and VL1' through 3 is 900V or more. | |
| | | | xx0C | The grid bias obtained from Vd1 through 3 and VL1 through 3 is 200V or less. | |
| | | | xx0D | The grid bias obtained from Vd1 through 3 and VL1 through 3 is 900V or more. | |
| 5 | | Computes the laser output (V00) for each color based on measurement. | xx00 | The laser output (V00) obtained from Vd1' through 3' and VL1' through 3' is 100V or less. | |
| | | | xx01 | The laser output (V00) obtained from Vd1' through 3' and VL1' through 3' is 900V or more. | |
| | | | xx08 | The laser output (V00) obtained from Vd1 through 3 and VL1 through 3 is 100V or less. | |
| | | | xx09 | The laser output (V00) obtained from Vd1 through 3 and VL1 through 3 is 900V or more. | |
| 6 | | Computes the developing bias for each color based on measurement. | xx06 | The developing bias obtained from Vd1' through 3' and VL1' through 3' is 200V or less. | |
| | | | xx07 | The developing bias obtained from Vd1' through 3' and VL1' through 3' is 700V or more. | |
| | | | xx0E | The developing bias obtained from Vd1 through 3 and VL1 through 3 is 200V or less. | |
| | | | xx0F | The developing bias obtained from Vd1 through 3 and VL1 through 3 is 700V or more. | |
| 7 | | Computes the laser output (VFF) for each color based on measurement. | xx02 | The laser output (VFF) obtained from Vd1' through 3' and VL1' through 3' is 10V or less. | |
| | | | xx03 | The laser output (VFF) obtained from Vd1' through 3' and VL1' through 3' is 800V or more. | |
| | | | xx0A | The laser output (VFF) obtained from Vd1 through 3 and VL1 through 3 is 10V or less. | |
| | | | xx0B | The laser output (VFF) obtained from Vd1 through 3 and VL1 through 3 is 800V or more. | |


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## 5. Potential Measuring Circuit

Figure 3-508 is a block diagram of the potential measuring circuit.

A charge equivalent of the drum surface potential is induced on the electrode within the sensor by the work of an electrical power line and turned into an AC voltage by the opening/closing action of the chopper and sent to the pre-amplifier; thereafter, it is sent to the filter/gain adjusting circuit on the potential measuring PCB.

The filter/gain adjusting circuit removes electrical noise from the AC signals coming from the pre-amplifier of the sensor and, after further amplifying the AC signals, it sends them to the sync clamp circuit through a photocoupler.

The AC signals coming from the filter circuit and gain adjusting circuit and the sync signals which have been adjusted in the sync signal adjusting circuit are combined in the sync clamp circuit to identify whether the drum surface potential is positive or negative.

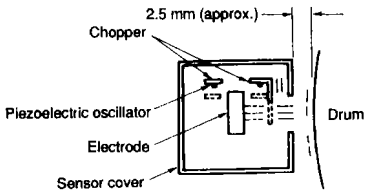


Figure 3-506 Sensor Cross Section

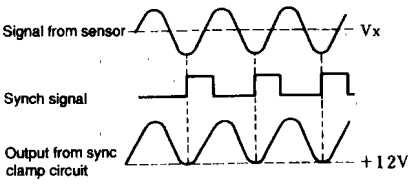


Figure 3-507 Surface Potential Greater than Sensor Bias

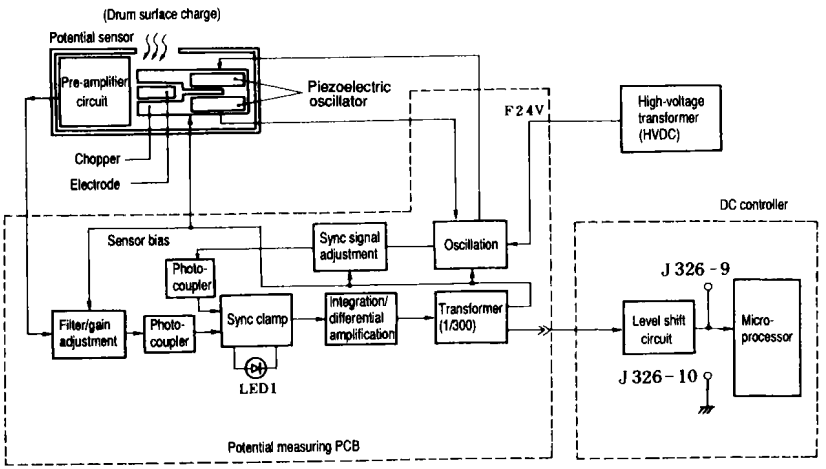


Figure 3-508

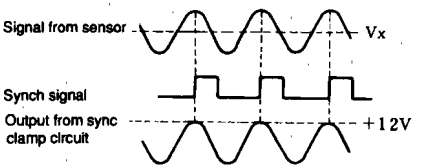


**Figure 3-509 Sensor Bias Greater than Surface Potential**

The output of the sync clamp circuit is processed (integrated) by the integrating circuit and is applied to the transformer. According to the output signal, the output of the transformer varies between 0 V and –600 V and is applied to the sensor; at the same time, its voltage is lowered to 1/300 and sent to the level shift circuit of the DC controller PCB.

A 0V-reference signal is converted to a 1V-reference signal and, at the same time, the signal is amplified (to about 1/255).

The level shift circuit output signal (analog) is sent to the microprocessor on the DC controller as it is.

**a. Making Checks**

① Checking Activation of LED1

Normally, LED1 remains on as long as the copier is supplied with power.

Otherwise, suspect that the F24V power is not supplied to the power supply or the potential measuring unit is faulty.

**Reference:**

You may assume that the potential sensor is operating normally if LED1 is on normally.


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## 6. Setting the Grid Bias and Developing bias

The grid bias and developing bias DC component are determined based on VD and VL obtained by initial drum surface potential control and the target contrast potential obtained by automatic gradation correction control in user mode.

To ensure the absence of fogging on copies, a line is drawn for the developing bias DC (Vdc) at points (differ depending on moisture content) that represent the sum of Vd and Vback (about +120 V).

A point is located where the potential (contrast potential) between Vdc and $V_L$ is identical to the target contrast potential; see Figure 3-510.

Based on such a point, the target values for the gird bias and developing bias are obtained.

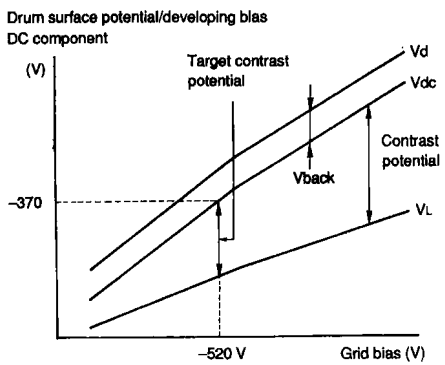


Figure 3-510

**Reference:**

- Target Contrast Potential

  The term *contrast potential* refers to a potential in between Vdc and $V_L$ (developing bias).

  The characteristics of the developer tend to change according to the environment around the developing assembly, affecting the density of the images. A constant degree of image density may be obtained unaffected by changes in the environment through controlling the contrast potential.

  See Figure 3-511 for the relationship between the changes in the environment and optimum contrast potential.

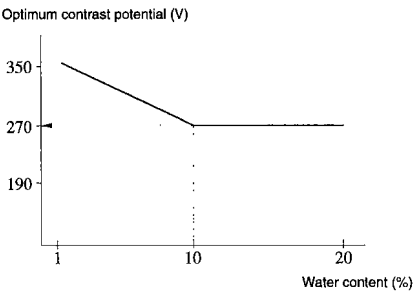


Figure 3-511

Conventional copiers determine the optimum contrast potential based on the data read by the environment sensor at time of power-on; by auto-matic gradation correction control.

**Reference:**

- Setting the Manual Contrast Potential
  To provide means for checking the potential control system, the copier offers seven-step contrast potential selections; you may select/switch any of the settings in service mode. However, note that individual contrast potential settings are fixed and cannot be varied.

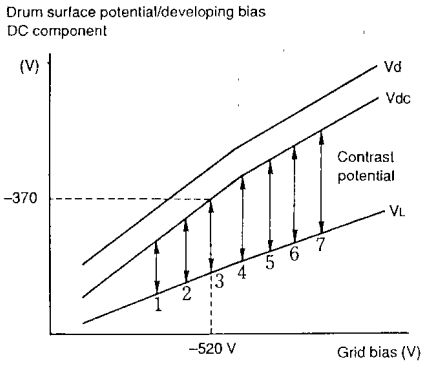


**Figure 3-512**

## 5. Correction against Changes in the Environment

The characteristics of the developer are subject to changes in the environment around the developing assembly, affecting the image density.

The copier is designed to find out the target contrast potential during automatic gradation correction control in user mode; in addition, to suit the changes that may have taken place in the environment, the copier is equipped with an environment sensor to monitor the temperature and humidity around the developing assembly. The copier corrects the target contrast potential based on the measurements taken by the sensor in response to each press on the Copy Start mode.


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## 6. Automatic Gradation Correction Control in User Mode

The relationship between the laser output and the image density is as shown in Figure 3-513.

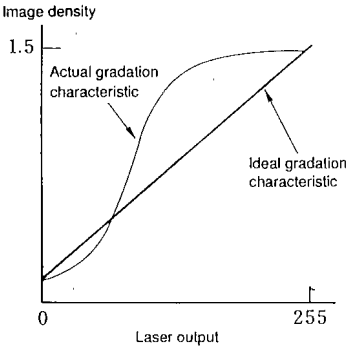


**Figure 3-513**

The copier actually develops, transfers, and fixes a solid patch of each color and of halftone in 64 gradations; the density of the output image is read by the CCD of the reader unit.

The contrast potential is determined based on the density data of each solid patch and the actual gradation characteristics are examined based on the density data of 64-gradation halftone outputs to correct the laser output, thereby realizing ideal gradation characteristics.

**b. Operations**

See Chapter 1 for how to make use of user mode.

1) In user mode, generate Test Print 1 for automatic gradation correction, i.e., halftone and solid patches (Figure 3-514).

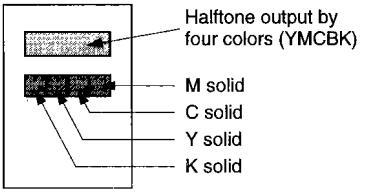


**Figure 3-514 Test Print 1**

2) On Test Print 1, check the density for difference and the images for faults; as necessary, perform the Basic Image Adjustment Procedure. If no fault is found, operate the reader unit to read in the solid images.
The data representing these solid images is used to determine the contrast potential.

3) In user mode, generate Test Print 2 for automatic gradation correction (64 gradations for each color; Figure 3-515). At this time, the copier uses the contrast potential it determined in step 1 above.

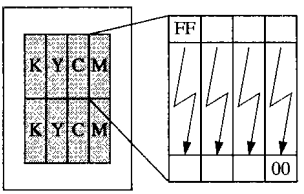


**Figure 3-515 Test Print 2**

4) Operate the reader unit to read Test Print 2.
The copier prepares a graph representing the output and input values (Figure 3-513), and determines the correction value to ensure an ideal gradation characteristic.

# D. Controlling the Grid Bias

## 1. Outline

The grid bias of the copier's primary corona assembly is controlled by the grid bias level signal (HVGI) from the DC controller PCB and sent to the HVT PCB; see Figure 3-516.

The grid bias level signal (HVGI) is an analog signal of between +8 V and +16 V generated by the DC controller PCB based on data obtained by controlling the potential. A grid voltage that corresponds to the grid bias level signal (HVGI) is applied to the grid wire of the primary corona assembly.

The HVT PCB also serves to supply the potential measuring PCB with power.

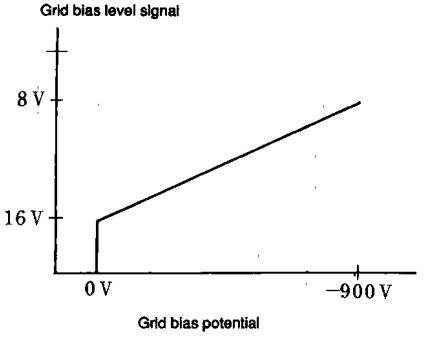


**Figure 3-516**

## 2. Operation

As long as the power switch remains on, the high-voltage control IC (IC1) on the HVT PCB keeps the grid bias drive signal (HVGC) on, and the grid bias high-voltage transformer remains on. If the grid bias level signal (HVGI) drops below 16 V, a grid bias corresponding to HVGI is supplied; at this time, the constant voltage control circuit feeds the grid bias voltage as reference to control the grid bias to a constant voltage.

The overcurrent detecting circuit is provided as a protection circuit; if a short-circuit or the like occurs on the grid wire, and the overcurrent detection signal (HVGOC) is sent to the high-voltage control IC (IC1), the high-voltage IC (IC1) causes the grid bias drive signal (HVGC) to remain '0' for 0.1 sec. Then, the circuit returns to normal; if the grid wire continues to have a short circuit, the entire copy will carry error images.


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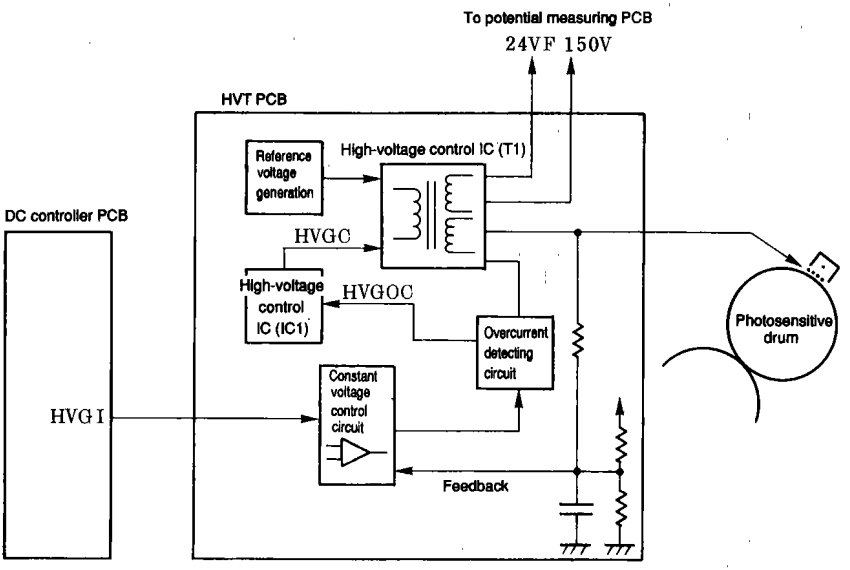
To potential measuring PCB
24VF 150V
HVT PCB
Reference voltage generation
High-voltage control IC (T1)
DC controller PCB
HVGC
High-voltage control IC (IC1)
HVGOC
Overcurrent detecting circuit
Photosensitive drum
HVGI
Constant voltage control circuit
Feedback

Figure 3-517

# E. Controlling the Developing Bias

## 1. Outline

The copier's developing bias consists of double blank pulses and DC bias, and is generated in the developing bias PCB.

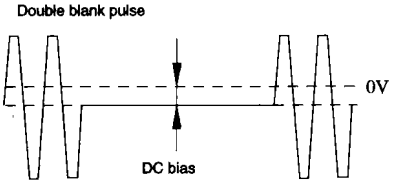


**Figure 3-518**

As shown in Figure 3-518, the developing bias PCB consists of the double blank pulse high voltage generating circuit, double blank pulse high voltage generating circuit, and double blank pulse output switching circuit used in common by four colors; in addition, it has two DC bias generating circuits, one each for M/Y and C/Bk. The double blank pulses generated by the circuit are switched into the two channels of MY/CBk by the double blank pulse output switching circuit and, after being synthesized with the DC bias, are sent to the output switching circuit; then, the pulses are sent to the developing assembly of each colors at such times as controlled by the DC controller PCB. As many as eleven lines of control signals from the DC controller PCB are sent to the developing bias PCB, each executing its respective control.

- Developing bias PCB drive control (DESBY)
- Double blank pulse on/off control (DBBPC1, DBBPC2)
- DC bias on/off control (DBDCC1, DBDCC2)
- DC bias application voltage level control (DBDCI1, DBDCI2)
- MCYBk switching control (DBS1, DBS2, DBS3, DBS4)


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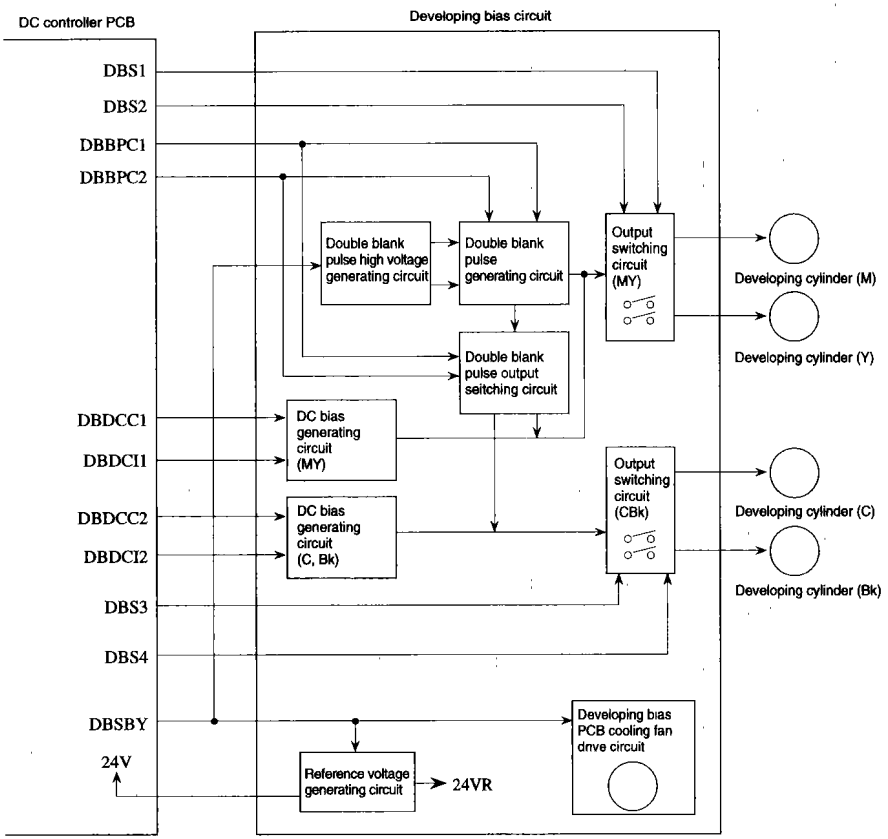
DC controller PCB
Developing bias circuit
DBS1
DBS2
DBBPC1
DBBPC2
Double blank pulse high voltage generating circuit
Double blank pulse generating circuit
Output switching circuit (MY)
Developing cylinder (M)
Developing cylinder (Y)
Double blank pulse output switching circuit
DBDCC1
DBDCI1
DC bias generating circuit (MY)
Output switching circuit (CBk)
DBDCC2
DBDCI2
DC bias generating circuit (C, Bk)
Developing cylinder (C)
Developing cylinder (Bk)
DBS3
DBS4
DBSBY
Developing bias PCB cooling fan drive circuit
24V
Reference voltage generating circuit
24VR

**Figure 3-519**

## 2. Operation

**a. Drive control of Developing Bias PCB**

- DBSBY=0

→ Reference voltage generating circuit turns on and developing bias PCB cooling fan drive circuit turns on

→ Power supplied to each circuit and developing bias PCB cooling fan turns on

**b. On/Off Control of Double Blank Pulses**

- DBSBY=1

→ Double blank pulse high voltage generating circuit turns on

- DBBPC=1

→ High-voltage supplied to double blank pulse generating PCB

→ Double blank pulse output circuit turned on

**c. On/Off Control of DC Bias and Level Control**

The developing DC bias is turned on and off by DBDCC1 and DBDCC2; DBDCC1 is the drive signal of the Y/M bias generating circuit, and DBDCC2 is the drive signal of the C/K bias generating circuit.

Based on the data obtained by potential control, the DC controller generates the DC level signal (DBDCI1, DBDCI2) for the developing bias. DBDCI1 serves as the DC level signal for C and K; DBDCI1 and DBDCI2 are analog signals of between +8 V and +16 V, and a DC bias that corresponds to the DC level signal is sent to the output switching circuit.

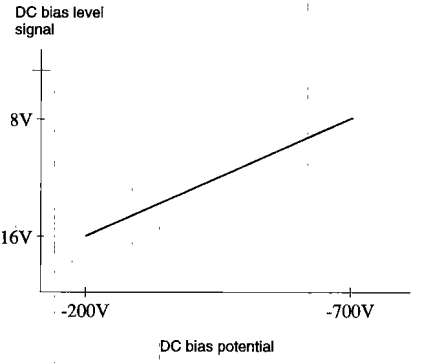


**Figure 3-520**

**d. MCYBk Switching Control**

The double blank pulses and DC bias are supplied to the developing cylinder after they are sent to the output switching circuit by the developing bias selection signal (DBS1, DBS2, DBS3, DBS4).

DBS1=1, DBS2, DBS3, DBS4=0: this condition supplies the M developing cylinder with a developing bias.

DBS2=1, DBS1, DBS3, DBS4=0: this condition supplies the Y developing cylinder with a developing bias.

DBS3=1, DBS1, DBS2, dBS4=0; this condition supplies the C developing cylinder with a developing bias.

DBS4=1, DBS1, DBS2, DBS3=0: this condition supplies the BK developing cylinder with a developing bias.


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# F. Controlling the Primary Corona Current

## 1. Outline

Figure 3-521 shows the circuit that controls the primary corona and has the following functions.

- Turns on and off the primary corona current.
  The copier's primary corona current output is controlled to a specific current to eliminate the effects of changes in the environment on the corona discharge.

## 2. Operation

The primary corona current is turned on and off by the primary corona current on signal (HVPR*).

- HVPR*=0
  Variable pulse width oscillating circuit turns on.
  Primary high-voltage transformer turns on.
- HVPR*=1
  Variable pulse width oscillating circuit turns off.
  Primary high-voltage transformer turns off.

The level of the primary corona current is fed back to the variable width oscillating circuit; a specific current is maintained through comparison of the level against the reference voltage.

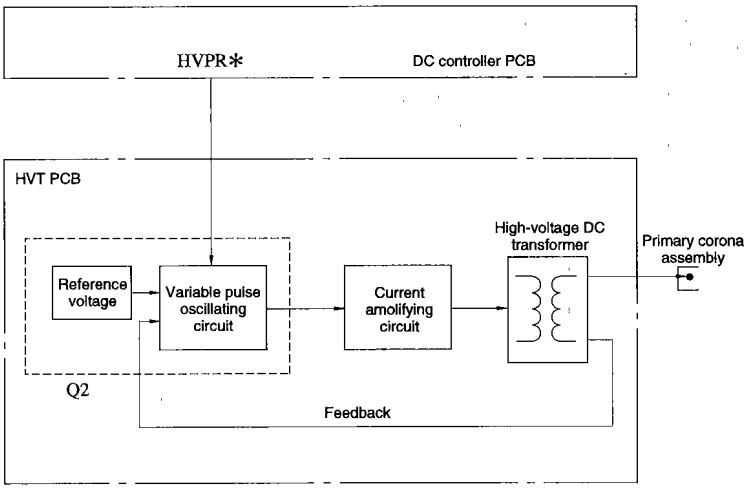


**Figure 3-521**

## G. Controlling the Attraction Charge Current

### 1. Outline

Figure 3-522 is a block diagram of the retention charge current control circuit.

The circuit is controlled by the retention charge current on/off control signal (HVATC) and retention charge current level control signal (HVATI) from the DC controller PCB.

The DC controller PCB generates HVATI of an appropriate level according to the type of copy paper (plain, thick, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the retention charge current to a specific level of current as in the case of the primary corona current.

To suit the selected copy mode, the potential of the transfer drum sheet is controlled between –7.5 kV and +5 kV while the retention brush is on.

To enable this, the circuit is provided with a mechanism that shifts the high-voltage output between positive and negative polarities depending on the output current.

### 2. Operation

HVATC=1

→ A charge current according to the level of HVATI (8 V to 16 V) is generated.

HVATC=0

→ The charge current output is '0' regardless of the level of HVATI.

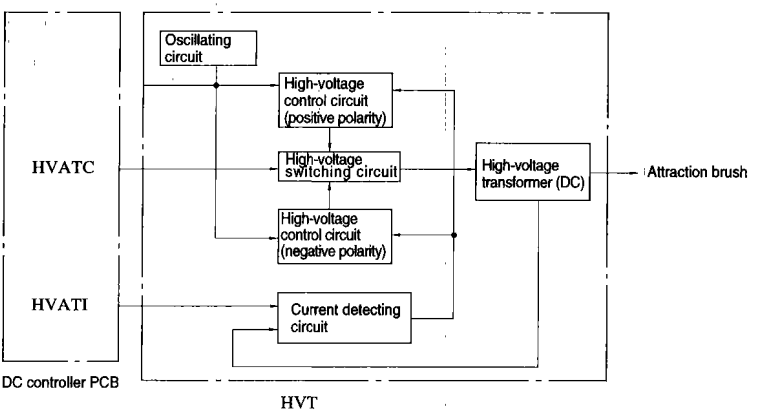


**Figure 3-522**


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# H. Controlling the Transfer Charge Current

## 1. Outline

Figure 3-523 is a block diagram of transfer charge current control circuit.

The circuit is controlled by the transfer charge current on/off control signal (HVTRC) and transfer charge current level control signal (HVTRI) from the DC controller PCB.

The DC controller PCB generates HVTRI of an appropriate level to suit the type of copy paper (plain, thick paper, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the transfer charge current to a specific level of current as in the case of the primary corona current.

To suit the selected copy mode, the potential of the transfer drum sheet is controlled to any of four settings between –7.5 kV and +5 kV while the transfer brush is on.

To enable this, the circuit is equipped with a mechanism that switches the high-voltage between positive and negative polarities according to the output current.

## 2. Operation

HVTRC=1

→ A charge current according to the level of HVTRI (8 V to 16 V) is generated.

HVTRC=0

→ The charge current output is '0' regardless of the level of HVTRI.

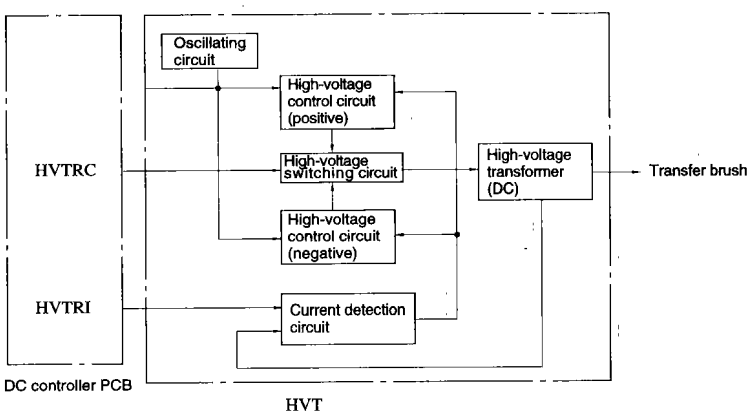


**Figure 3-523**

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# I. Controlling the Separation Charge Current

## 1. Outline

Figure 3-524 is a block diagram of the separation corona charging assembly control circuit.

The circuit is controlled by the separation charge on/off control signal (HVSPC) and separation charge level control signal (HVSPI) from the DC controller PCB.

The DC controller PCB generates HVSPI of an appropriate level to suit the type of copy paper (plain, thick paper, transparency) and the temperature and humidity registered by the environment sensor. The circuit controls the charge current (DC bias component) to a constant current level; it also controls the charge voltage (AC component) to a specific voltage level.

## 2. Operation

HVSPC=1

→ High voltage according to the level of HVSPI (8 V to 16 V) is generated.

HVSPC=0

→ The high-voltage output is '0' regardless of the level of HVSPI.

**Reference:**

Stray toner occurring as a result of separation charges will not be a problem in a high-humidity environment and, therefore, the corona output is controlled so that it is '0'.

At time of shipment, the machine is adjusted so that it identifies a high-humidity condition at '8.5 g' or higher ('DISPLAY: ANALOG: BODY g' in service mode).

The separation corona output and the humidity slice level (machine inside humidity absolute value) may be varied in service mode (ADJUST: HV-SP, SP-OFST).

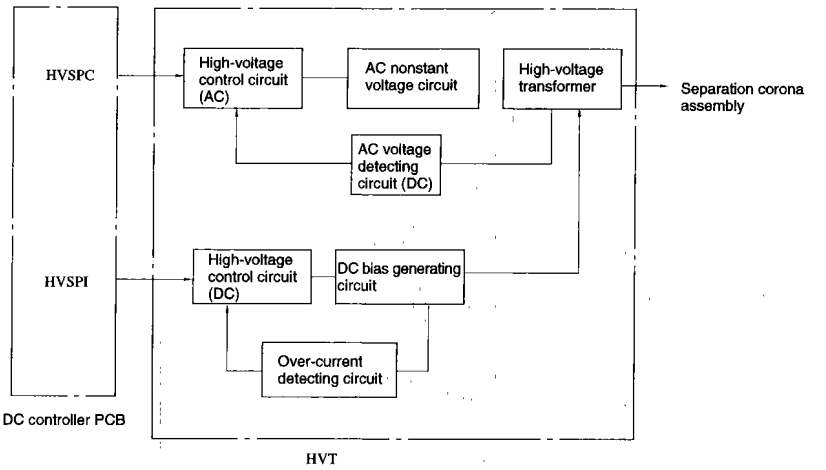


**Figure 3-524**


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# J. Controlling the Static Eliminator Current

## 1. Outline

Figure 3-525 is a block diagram of the static eliminator corona assembly control circuit.

The circuit controls the charge current of the external/internal static eliminator to a constant current level.

The circuit controls the internal static eliminator and external static eliminator separately based on the static eliminator charge on/off control signal (O-REM, I-REM) from the DC controller.

## 2. Operation

I-REM=1

→ The high voltage of the internal static eliminator is generated.

I-REM=0

→ The high voltage of the internal static eliminator is '0'.

O-REM=1

→ The high voltage of the external static eliminator is generated.

O-REM=0

→ The high-voltage of the external static eliminator is '0'.

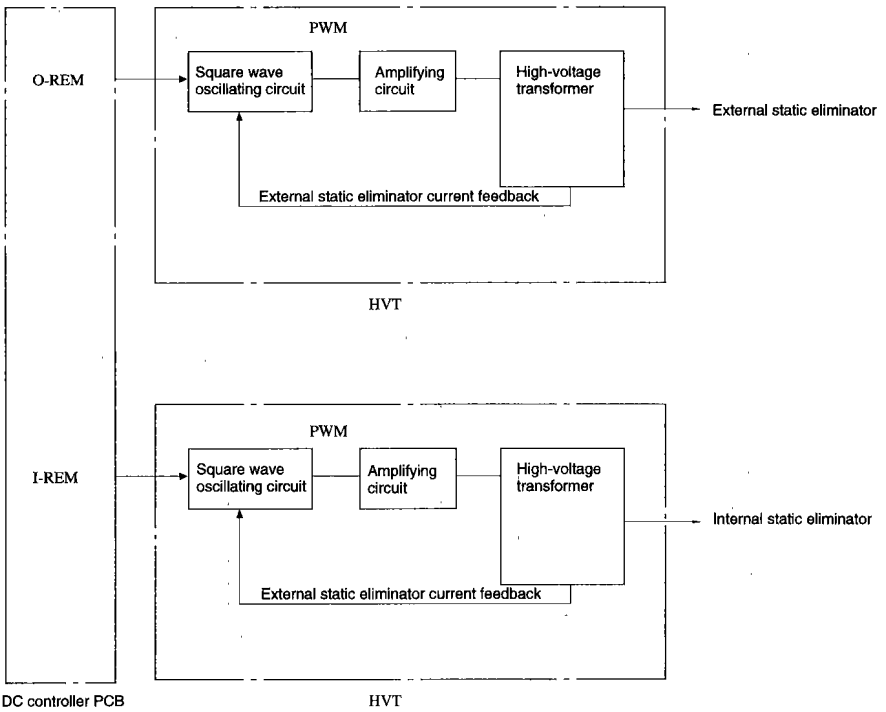


**Figure 3-525**

# K. Controlling the Photosensitive Drum Temperature

## 1. Outline

The sensitivity of the photosensitive drum varies according to the site environment (temperature and humidity).

To prevent changes in the sensitivity of the drum, a drum heater (60 W) is installed along the drum axis to control the temperature around the drum to a specific value.

## 2. Control System

When the power saving switch (SW10) is at its normal position, the drum heater is supplied with power regardless of the position of the main switch; when the power saving switch is at the saving position, the drum heater is supplied with power only when the main switch is turned on. (See Figure 3-528.)

The temperature around the drum is monitored by the thermistor nearby, and communicated to the drum heater controller PCB. If the temperature around the drum is lower than a specific value, the drum heater is supplied with power through an SSR.

If the temperature rises to an error temperature, the control IC cuts off power to the drum heater.

Specific temperature ... 33°C (26°C)

High-temperature error temperature ... 50°C

To limit the consumption of power, the DC controller PCB generates the DRHOFF signal to cut out power to the drum heater through the SSR2 when another heater is on (115 V only).

If the DC controller identifies an error in the machine (fault in the fixing heater, for example), the SHUTOFF* signal turns off the main switch to cut out power to the drum heater.

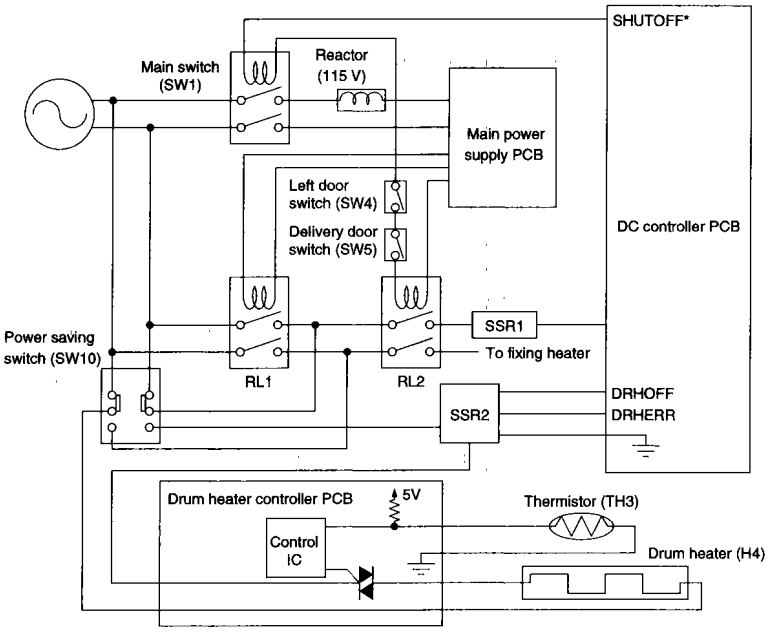


**Figure 3-526**


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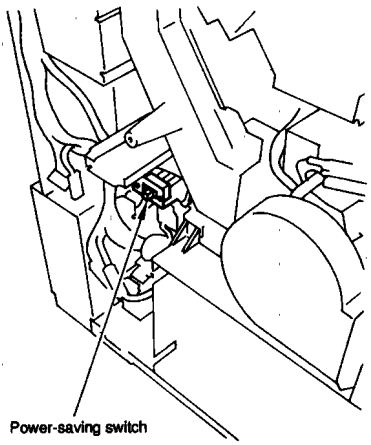


Figure 3-527

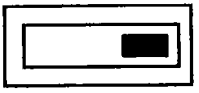


Figure 3-528 Power-Saving Switch (Rear View)

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# L. Controlling the Primary Corona Wire

## 1. Outline

The copier is equipped with an automatic cleaning mechanism for the primary corona wire which operates under the following conditions:

① When the DC controller identifies that the temperature of the fixing assembly is 130°C or less when the power is switched on.

② When primary corona wire cleaning is executed in user mode.

③ When image formation has been executed 2000 times on the photosensitive drum.

## 2. Operation

The primary corona wire cleaning motor (M7) is rotated in normal direction for about 12 sec; the cleaning felt is moved forward and butted against the rear.

After this normal rotation is over, the motor is rotated in reverse for about 12 sec; the cleaning felt moves in reverse and returns to the front.

The protection resistor is used to control overcurrent occurring when the cleaning felt butts against the front or rear.

**Reference:**

M7FW=1, M7RV=0
↳ Normal rotation
M7FW=0, M7RV=1
↳ Reverse rotation

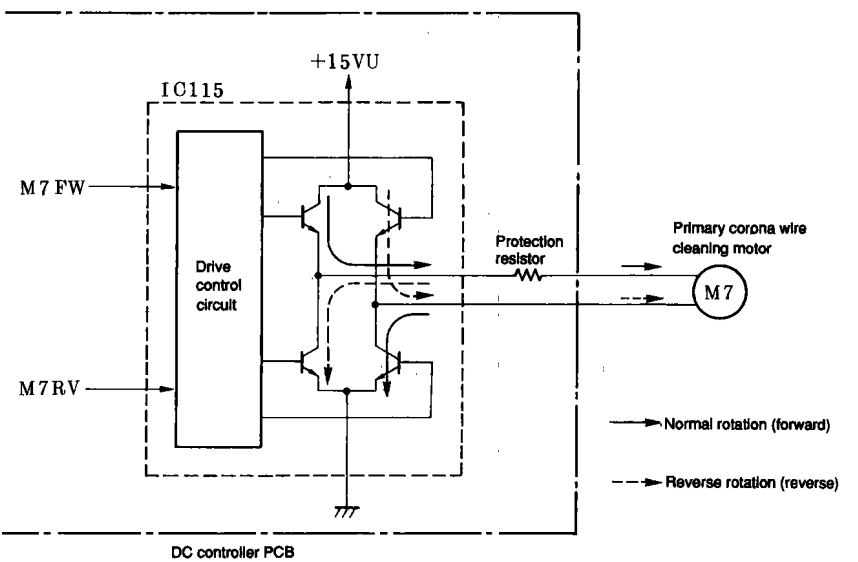


Figure 3-529


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# M. Developing Assembly/Photosensitive Drum Cleaning Assembly

## 1. Outline

The developing assemblies for four colors are arranged around the photosensitive drum. Each of the developing assembly is engaged by the drive of the main motor transmitted by the developing assembly engagement solenoid (SL1 through SL4). The drive of the main motor is transmitted to the developing cylinder when the developing cylinder clutch (CL1 through CL4) turns on.

The density of toner inside the developing assembly is detected by the color toner density sensor (ATR1 through ATR3) and black toner density sensor (ATR4) when the developing assembly is engaged with the photosensitive drum.

When the toner density drops below the specified value, the toner supply clutch (CL5 through CL8) turns on to transmit the drive of the hopper motor to the hopper, thereby supplying toner.

The toner level sensor (TS1 through TS4) checks to see if the level of toner inside the hopper has dropped below the specified level.

The waste toner collected by the photosensitive drum cleaning assembly is forwarded to the waste toner container by the drive of the main motor. The waste toner pipe is equipped with a waste toner feed screw lock detection switch (MS4) and the waste toner container is equipped with a waste toner full sensor (PS42).

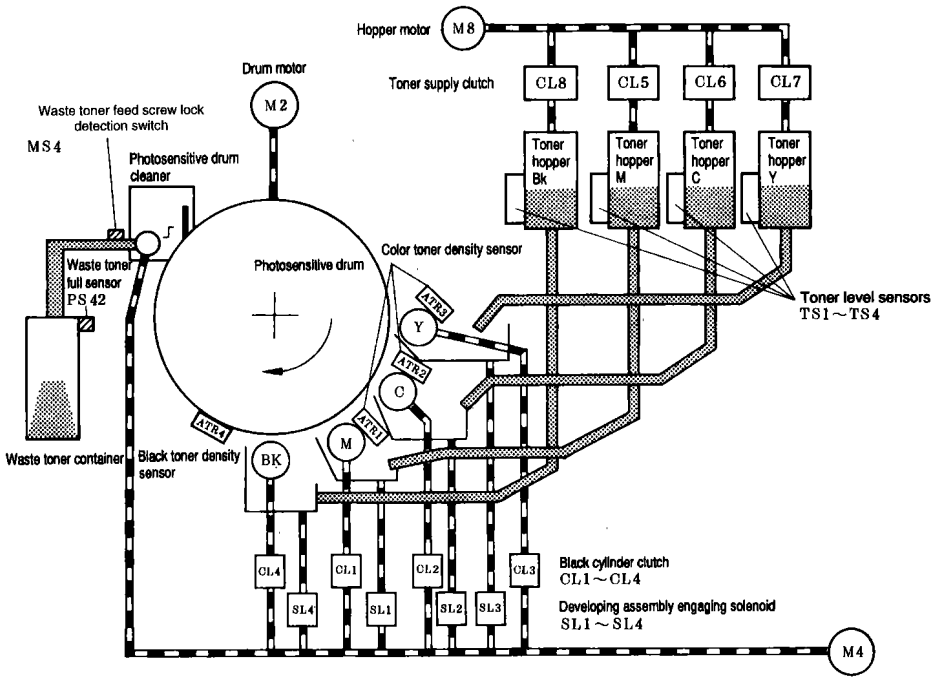


Figure 3-530

## 2. Developing Assembly Engagement

When the developing assembly engaging solenoid (SL1 through SL4) turns on, the developing assembly engaging cam rotates, and the developing assembly is engaged with the photosensitive drum by the drive of the main motor.

Figure 3-531 shows the state in which the cyan developing assembly is engaged.

In case of making a 4-color copy, the developing assemblies are engaged in the order of M, C, Y, and Bk.

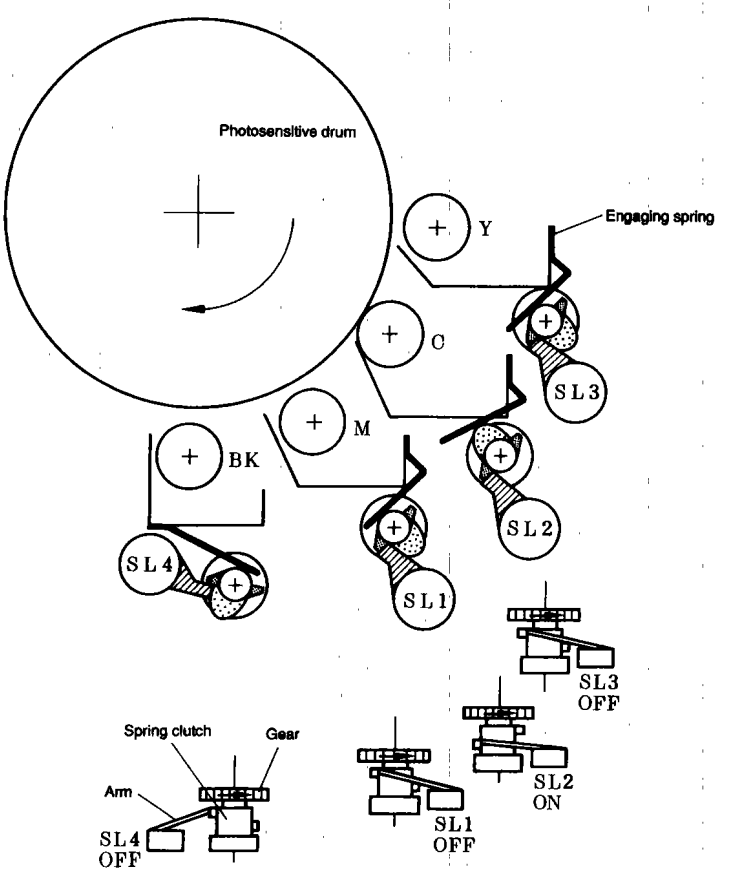


**Figure 3-531 C Developing Assembly Engagement**


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## 3. Detecting the Color Toner Density

### a. Outline

Each of the developing assemblies (M, C, and Y) is equipped with a single color toner density sensor, which checks the density of the developer inside any of the operating developing assembly during copying operation.

The sensors are of a photoelectric type, and detects the light (near infrared) reflected by the developing cylinder by a photodiode; toner is supplied according to the difference between the reading and the initial setting.

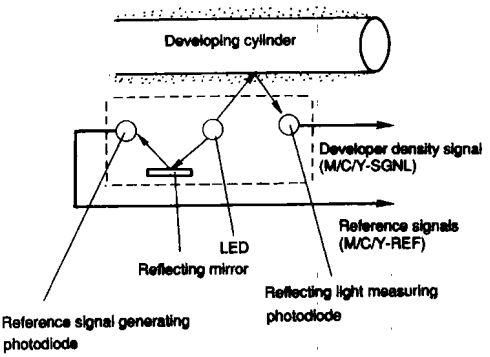


Figure 3-532

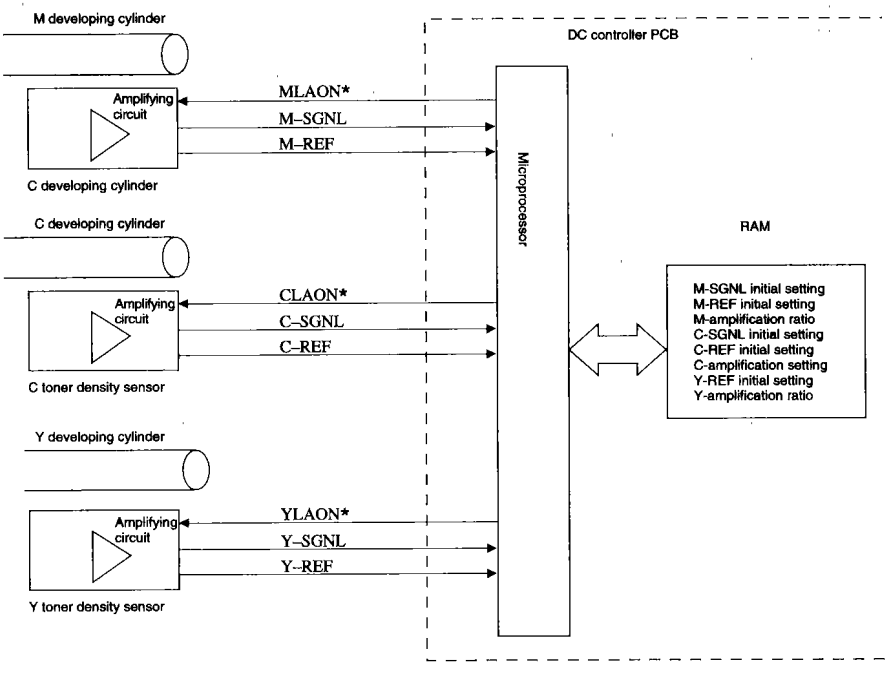


Figure 3-533

**Reference:**

This mechanism of detection takes advantage of the fact that both paint and toner reflect infrared light but the carrier (iron powder) of the developer absorbs it. In other words, the infrared light reflected by the developer decreases as the toner inside the developer decreases.

In addition to the photodiode used to detect the density of toner, each sensor possesses a photodiode that generates reference signals used to detect the deterioration of the LED.

The copier's color toner density detection/adjustment is executed in response to a command in service mode after supplying the starter developer.

**b. Initial Settings (FUNC, INSTALL, INIT-M/C/Y)**

You must execute 'FUNCT', 'INSTALL,' and 'INIT-M/C/Y' at time of installation or whenever you have replaced the developer or the toner density sensor.

The copier's 'INIT-M/C/Y' automatically executes the following functions, which are executed by a hardware VR and in service mode in the existing models.

- reads the reference signal (REF-M/C/Y)
- sets the gain (SGAIN-M/C/Y)
- reads the initial developer density signal (SGNL-M/C/Y)
- writes the REF-M/C/Y, SGAIN-M/C/Y, and SGNL-M/C/Y values into RAM

**c. Detecting the Density**

A LED is turned on while the developing cylinder is rotating with the developing assembly engaged with the photosensitive drum. The microprocessor reads the toner density signal and reference signals, and compares them against the initial reading stored in RAM to compute the change that may have taken place in the density.

The copier determines the amount of toner to be fed based on this change in density, and supplies toner from the hopper.

See Table 3-503 for the names of the signals and the names used in service mode.

| Signal | Adjustment | Notation in service mode |
|---|---|---|
| Y reference signal (Y-REF) | — | REF-Y |
| C reference signal (C-REF) | — | REF-C |
| M reference signal (M-REF) | — | REF-M |
| M toner density signal (M-SGNL) | 818 ±41 | SGNL-M |
| C toner density signal (C-SGNL) | 818 ±41 | SGNL-C |
| Y toner density signal (Y-SGNL) | 818 ±41 | SGNL-Y |

**Table 3-503**

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## 4. Measuring the Black Toner Density

### a. Outline

The black toner density sensor is found outside the photosensitive drum, and is used to measure the density of the toner image of black (Bk) that has been developed on the photosensitive drum.

Like the color toner density sensor inside each of the developing assemblies (MCY), the black toner density sensor is of a photoelectric type, which detects the light reflected by the toner on the drum by a photodiode.

The copier also executes LED deterioration correction and window dirt correction to ensure accurate measurement of the toner density.

The copier's black toner density detection/adjustment is executed in response to a command in service mode after supplying the starter developer.

**Reference:**

Each type of toner (MCY) reflects infrared light emitted by a LED; however, Bk toner absorbs infrared light.

With reference to the reflection rate of the photosensitive drum, the following is true:
Bk toner < photosensitive drum < MCY toner

Taking advantage of such a characteristic, the copier measures the density of Bk toner on the drum.

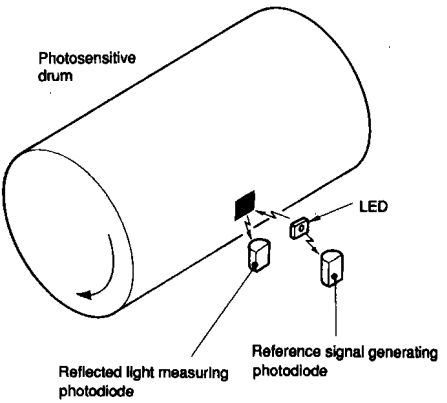


Figure 3-534

### b. Initial Settings (FUNC, INSTALL, INIT-K)

You must execute 'FUNCT', 'INSTALL,' and 'INIT-K' at time of installation or whenever you have replaced the developer or the toner density sensor.

The copier's 'INIT-K' automatically executes the following functions, which are executed by a hardware VR and in service mode in the existing models.

- reads the reference signal (REF-K/D)
- sets the gain (SGAIN-K, RGAIN-K)
- reads the initial developer density signal/ drum surface density signal (SGNL-K/D)
- writes the REF-K/D, SGAIN-K, RGAIN-K, and SGNL-K/D values into RAM

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**c. Detecting the Density**

A black toner image is developed on the photosensitive drum, and the LED of the Bk toner density sensor is turned on. The microprocessor reads the black toner density signal and reference signal and compares them against the initial settings stored in RAM to compute the change in the density.

Toner is supplied by the hopper according to the change so computed.

See Table 3-504 for the signal names and the names used in service mode.

| Signal name | Standard | Name in service mode |
|---|---|---|
| Bk toner density signal (Bk-SGNL) | 375 ± 35 | SGNL-K |
| | 614 ± 21 | SGNL-D |
| Bk reference signal (Bk-REF) | 818 ± 41 | REF-K |
| | 818 ± 41 | REF-D |

**Table 3-504**

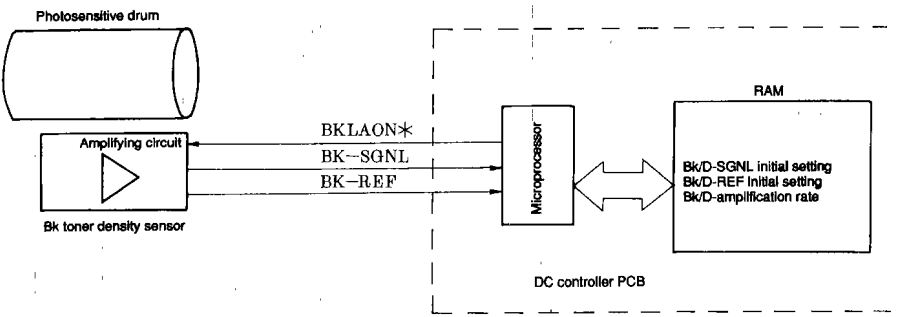


**Figure 3-535**

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**d. Detecting Dirt on the Window**

At power-on and during control rotation (CNTR) that follows a press on the Copy Start key, a LED is turned on to measure Bk-SGNL without toner on the photosensitive drum; at this time, the value of Bk-SGNL is small if the sensor window is soiled. The ratio of the reading of Bk-SGNL and specified value is stored as a correction value, and is used to correct the sensor output for toner density control (inside black developing assembly).

If the measurement Bk-SGNL is 75% or less of the specified value, the copier indicates 'E020'.

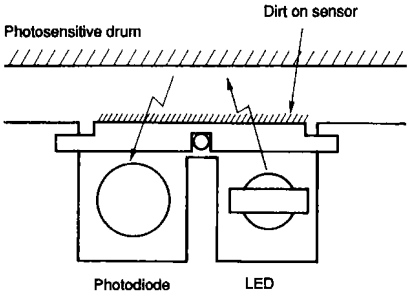


**Figure 3-536**

**e. Controlling the Density of Toner Inside the Black Developing Assembly**

When the black developing assembly is engaged with the photosensitive drum, the laser is turned on to form a black toner image on the photosensitive drum. A LED is turned on immediately before the black toner image moves past the front of the sensor, and the black toner density signal and reference signal are read while the image is moving past the sensor. These signals are compared against the window dirt correction value and the initial setting stored in RAM to obtain the change that may have occurred in density.

According to the change, the copier determines the amount of toner and supplies toner from the hopper.

**Reference:**

Unlike YMC toners, the copier's black toner absorbs near infrared light; for this reason, exposure of the developer with near infrared light will not enable detection of the amount of toner in the developer.

Since the photosensitive drum reflects near infrared, however, exposure of the black toner image on the drum enables detection of the density of the toner.

In other words, a decrease in the amount of toner in the developer results in a decrease in the density of the black toner image, thereby increasing the reflected light.

**Reference:**

It is important to prevent adhesion of toner from the photosensitive drum to the transfer sheet when the density of black toner is detected during copying operation; to do so, the DC controller PCB must turn on the laser when the black toner image comes into contact with the metal transfer sheet for transfer to the transfer drum.

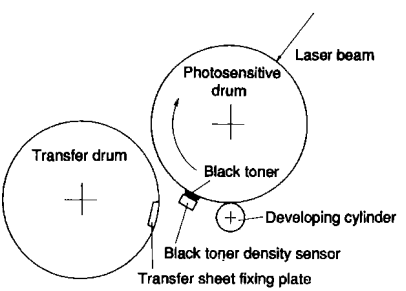


**Figure 3-537**

## 5. Error Code (E020) Associated with Controlling the Toner Density

### 1. E020

'E020' is an error code associated with toner density faults (ATR control).

ATR control may be used either when making initial settings at time of machine installation and developer replacement or when maintaining the toner density inside the developing assembly to a constant level as part of the copying sequence. In addition, control is executed differently between Bk toner and M/C/Y toner.

Here, the discussions are divided into ATR for Bk toner and ATR for M/C/Y toner, and 'E020' is explained together with detailed codes in relation to a series of operations.

a. Flow and Related Detailed Codes (initial setting for Bk developer)
b. Flow and Related Detailed Codes (initial setting for M/C/Y developer)
c. Bk – Related Flow and Detailed Codes at Power – On
d. Bk Toner Density Control Flow and Relate Detailed Codes during Copying Operation
e. M/C/Y Toner Density Control Flow and Related Detailed Codes during Copying Operation

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a. Flow and Related Detailed Codes (initial setting for Bk developer)

| Initial setting flow | | Operation | Related detailed code | | Error detection |
|---|---|---|---|---|---|
| 1. Supplying developer (FUNC → INSTALL → SPLY-K) | | Developer is put into the developing assembly. | | | |
| 2. Stirring (FUNC → INSTALL → STIR) | | The developer inside the developing assembly is stirred. | | | |
| 3. Reading the initial setting (FUNC → INSTALL → INIT-K) | 3.1 Idle rotation (30 sec) | The developer inside the developing assembly is stirred. | | | |
| | 3.2 Determining SGAIN-K/ RGAIN-K | The LED on the BK toner sensor is turned on, and its direct light is detected by the photosensor 1 while its light reflected by the drum surface is detected by the photosensor 2 to convert the intensity into a voltage.<br>Based on the measurement, SGAIN-K/ RGAIN-K is determined.<br>• Sets the gain (RGAIN-K) so that the intensity detected by the photo-sensor 1 is 4 V.<br>• Sets the gain (SGAIN-K) so that the intensity detected by the photo-sensor 2 is 3 V. | SG AIN-K | 0432 | SGAIN-K is 0. |
| | | | | 0442 | SGAIN-K is 255. |
| | | | | 0450 | GAIN cannot be set. |
| | | | RGAIN-K | 0433 | RGAIN-K is 0. |
| | | | | 0443 | RGAIN-K is 255. |
| | | | | 0451 | GAIN cannot be set. |
| | 3.3 Reading SGNL-D/ REF-D | After determining GAIN, the LED is turned on once again; its direct light is detected by the photosensor 1 and converted into voltage based on the gain determined in 3-2 to obtain REF-D; then, the light reflected by the drum surface is converted into voltage based on the gain determined in 3-2 to obtain SGNL-D. | SGNL-D | 0410 | The variation within a single sampling is 102 or more. |
| | | | | 0420 | The variation within 16 samplings is 102 or more. |
| | | | REF-D | 0400 | The value of REF-D is 50 or less; displaced connector, faulty sensor. |
| | | | | 0411 | The variation within a single sampling is 102 or more |
| | | | | 0421 | The variation within 16 samplings is 102 or more. |
| | 3.4 Reading SGNL-K/ REF-K | A total of 16 halftone BK patches (8 × 2 rotations) are made on the photosensitive drum, and the LED is turned on while doing so; its direct light is detected by the photosensor 1 to obtain REF-K as in 3-3; then, the light reflected by a patch on the drum surface is detected by the photosensor 2 to obtain SGNL-K. | REF-K | 0400 | The value of REF-K is 50 or less; displaced connector, faulty sensor. |
| | | | | 0411 | The variation of a single sampling is 102 or more. |
| | | | | 0421 | The variation within 16 samplings is 102 or more. |
| | 3.5 End (or re-measurement) | The flow is complete when the value of SGNL-K is 375 ±35.<br>Otherwise, the Bk patch density level is changed and 3-4 is repeated. The density level is changed and measurements are taken for a maximum of two times; if SGNL-K is not 375 ±35 after a total of three tries, an error is issued.<br>The change in the density level of the patches is based on PT-OFST (e.g., if PT-OFST=10, the image density is increased by 10 levels). | | 0431 | The initial setting is 777 or less. |
| | | | | 0441 | The initial setting is 859 or more. |
| | | | SGNL-K | 0410 | The variation within a single sampling is 102 or more. |
| | | | | 0420 | The variation within 16 samplings is 102 or more. |
| | | | | 0430 | The initial setting is 340 or less. |
| | | | | 0440 | The initial setting is 410 or more. |

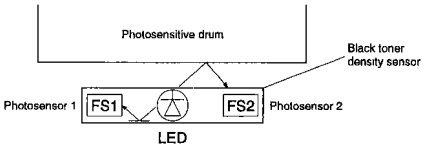


**Figure 3-538**

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b. Flow and Related Detailed Codes (initial setting for M/C/Y developer)

XX indicates the color of the developing assembly (toner). xx = 01: M, xx = 02: C, xx = 03: Y

| Initial setting flow | | Operation | Related detailed code | Error detection |
|---|---|---|---|---|
| 1. Supplies developer | | | | |
| 2. Stirs developer (FUNC -> INSTALL -> STIR) | | | | |
| 3. Reads initial settings (FUNCT -> INSTALL -> INTT - K) | 3.1 Reads the reference signals "REF - M/C/Y". | Turns on the LED in each toner sensor, and the direct light is received by the Photosensor 1 to measure and convert the light into voltage. Takes 16 samplings, each sampling consisting of 10 measurements. | xx00 | The connector is disconnected. |
| | | | xx11 | The variation of 10 measurements within a single sampling is 41 or more. |
| | | | xx21 | The variation in 16 samplings is 41 or more. |
| | | | xx31 | The setting of "REF - M/C/Y" is 144 or less. |
| | | | xx41 | The setting of "REF - M/C/Y" is 920 or more. |
| | 3.2 Sets the gains "SGAIN - M/C/Y". | Sets the gain so that the voltage measured in 3.1 will be 4V. | xx32 | The setting of "SGAIN - M/C/Y" is 0. |
| | | | xx42 | The setting of "SGAIN - M/C/Y" is 255. |
| | | | xx50 | The gain cannot be set. |
| | 3.3 Reads the initial settings "SGNL - M/C/Y". | Turns on the LED in each toner sensor, and the light is directed to the developing cylinder; the reflected light is measured by the photosensor 2 and converted into voltage. (The value is "SGNL - M/C/Y".) Takes 10 samplings, each sampling consisting of 10 measurements. | xx10 | The variation in the settings of "SGNL - M/C/Y" within a single sampling is 41 or more. |
| | | | xx20 | The variation in the settings of "SGNL - M/C/Y" within 16 samplings is 41 or more. |
| | | | xx30 | The setting of "SGNL - M/C/Y" is 777 or less. |
| | | | xx40 | The setting of "SGNL - M/C/Y" is 859 or more. |

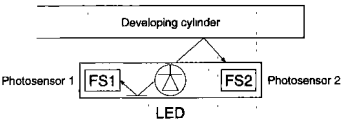


**Figure 3-539**


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c. Bk - Related Flow and Detailed Cods at Power - On

| Initial setting flow | | Operation | Related detailed code | Error detection |
|---|---|---|---|---|
| 1. Power switch on (starts initial multiple rotation) | | | | |
| 2. Checks soiling of window | 2.1 Reads "SGNL - D". | Turns on the LED in the Bk toner sensor, and the direct light is received by the photosensor 2 to measure and convert the light into voltage. | | |
| | 2.2 Makes comparisons and computations. | Compares "SGNL - D" read in 2.1 against "SGNL - D" read in initial setting in 2.1 and stored in memory. | 0460 | There is a decrease in intensity of 40% or more when compared against "SGNL - D" read during initial setting. |
| | | | 0470 | There is an increase in intensity of 40% or more when compared against "SGNL - D" read during initial setting. |

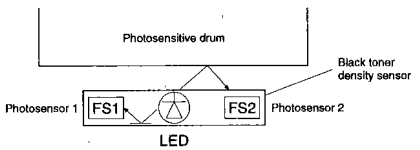


**Figure 3-540**

d. Bk Toner Density Control Flow and Relate Detailed Codes during Copying Operation

| | Initial setting flow | Operation | Related detailed code | Error detection |
|---|---|---|---|---|
| 1. | Copy Start key on (starts initial rotation) | | | |
| 2. | Checking the connector for disconnection | | 0400 | The connector is disconnected. |
| 3. | Checks soiling on the window (during initial rotation. | Same as at power - on. | 0460 | Same as at power - on. |
| | | | 0470 | Same as at power - on. |
| 4. | Forms a Bk halftone patch on the photosensitive drum. | Forms a patch opposite the joint plate of the transfer drum. | | |
| 5. Measures the density | 5.1 [REF - K] "SGNL - K". | Turns on the LED of the Bk toner density sensor to expose the photosensitive drum; the reflected light is received by the Photosensor 1, and its intensity is measured and converted to a voltage. Each sampling consists of 10 measurements, and a single sampling is taken. | 04A1 | The variation of "REF - K" within a single sampling is 102 or more. |
| | 5.2 Makes comparisons and computations. | Compares "REF - K" read in 5.1 and "REF - K" read during initial setting and stored in memory. | 04B1 | "REF - K" read in 5.1 is lower than "REF - K" read in initial setting by 30% or more. |
| | | | 04B1 | "REF - K" read in 5.1 is higher than "REF - K" read in initial setting by 30%. |
| | | | 0481 | "REF - K" stored in memory is 777 or less. |
| | | | 0491 | "REF - K" stored in memory is 859 or more. |
| | 5.3 Read "SGNL - K". | Turns on the LED in the Bk toner density sensor, and the light reflected by the patch on the photosensitive drum is measured by the photosensor 2 and converted into voltage. Takes a single sampling consisting of 10 measurements. | 04A0 | The variation in settings of "SGNL - K" within a single sampling is 102 or more. |
| | | | 04B0 | The setting of "SGNL - K" read is 102 or less. |
| | | | 04C0 | The setting of "SGNL - K" read is 550 or more. |

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| Initial setting flow | | Operation | Related detailed code | Error detection |
|---|---|---|---|---|
| 5. Measures the density | 5.4 Makes comparisons and computations. | Compares "SGNL - K" read in 3.1 against "SGNL - K" read in initial setting and stored in memory to identify the density of toner inside the developing assembly. | 0480 | The setting of "SGNL - K" stored in memory is 163 or less. |
| | | | 0490 | The setting of "SGNL - K" stored in memory is 470 or more. |
| | | | 04D0 | A setting for "SGNL - K" which is –3.0% or less in relation on "SGNL - K" stored in memory has been detected 20 times or more continuously. |
| | | | 04E0 | A setting for "SGNL - K" which is +3.0% or more in relation to "SGNL - K" stored in memory has been detected 20 times or more continuously. |

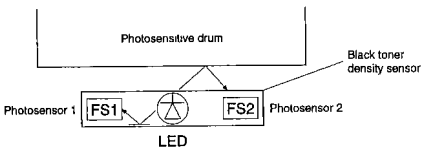


**Figure 3-541**

e. M/C/Y Toner Density Control Flow and Related Detailed Codes during Copying Operation

XX indicates the color of the developing assembly (toner). xx = 01: M, xx = 02: C, xx = 03: Y

| | Initial setting flow | Operation | Related detailed code | Error detection |
|---|---|---|---|---|
| 1. | Copy Start key on (starts initial rotation). | | | |
| 2. | Checking the connector for disconnection. | | xx00 | The connector is disconnected. |
| 3. Measures the density | 3.1 Reads "REF - M/C/Y". | The LED of each toner sensor is turned on, and its direct light is detected by the photosensor 1 and converted into voltage. As many as 10 measurements are grouped as one sampling. (During this period, a single sampling is executed.) | xxA1 | The variation in settings of "REF - M/C/Y" within a single sampling is 102 or more. |
| | 3.2 Makes comparisons and computations. | Compares "REF - M/C/Y" read in 3.1 against "REF - M/C/Y" read in initial setting and stored in memory. | xxB1 | The setting of "REF - M/C/Y" read in 3.1 is lower than the setting of "REF - M/C/Y" read in initial setting by 30% or more. |
| | | | xxC1 | The setting of "REF - M/C/Y" read in 3.1 is higher than the setting of "REF - M/C/Y" read in initial setting by 30% or more. |
| | | | xx81 | The setting of "REF - M/C/Y" stored in memory is 144 or less. |
| | | | xx91 | The setting of "REF - M/C/Y" stored in memory is 920 or more. |
| | 3.3 Reads "SGNL - M/C/Y". | Turns on the LED in each toner density sensor; the reflected light is received by the photosensor 2, and the intensity is measured and converted into voltage. Takes a single sampling consisting of 10 measurements. | xxA0 | The variation in settings of "SGNL - M/C/Y" within a single sampling is 102 or more. |
| | | | xxB0 | The setting of "SGNL - M/C/Y" read is 306 or less. |
| | | | xxC0 | The setting of "SGNL - M/C/Y" read is 1013 or more. |
| | 3.4 Makes comparisons and computations. | Compares "SGNL - M/C/Y" read in 3.3 against "SGNL -M/C/Y" read in initial setting and stored in memory to identify the density of toner inside the developing assembly. | xx80 | The setting of "SGNL - M/C/Y" stored in memory is 777 or less. |
| | | | xx90 | The setting of "SGNL - M/C/Y" stored in memory is 859 or more. |
| | | | xxD0 | A setting for "SGNL - M/C/Y" which is –3.0% or less in relation to "SGNL - M/C/Y" stored in memory has been detected 20 times or more continuously. |
| | | | xxE0 | A setting for "SGNL - M/C/Y" which is +3.0% or less in relation to "SGNL - M/C/Y" stored in memory has been identified 20 times or more continuously. |

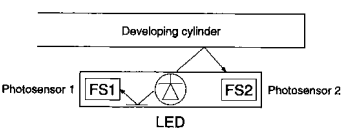


**Figure 3-542**


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## 6. Supplying Toner

The copier has four hoppers, each for M, C, Y, and Bk. Figure 3-543 is a cross section of the C hopper.

If the density of toner inside any of the developing assembly is below the specified value, the toner supply clutch for that developing assembly turns on.

The activation of the toner supply clutch causes the drive of the main motor (M4) to be transmitted to the feeding screw, thereby supplying the developing assembly with toner.

This supply operation is executed when the developing assembly is at the point of development.

The period during which the clutch remains on differs depending on the toner supply amount determined by the toner density detecting circuit.

Each hopper is equipped with a toner sensor (piezoelectric oscillator); when the toner falls below a specific level, the ADD TONER message is indicated on the control panel after finishing the ongoing copying cycle.

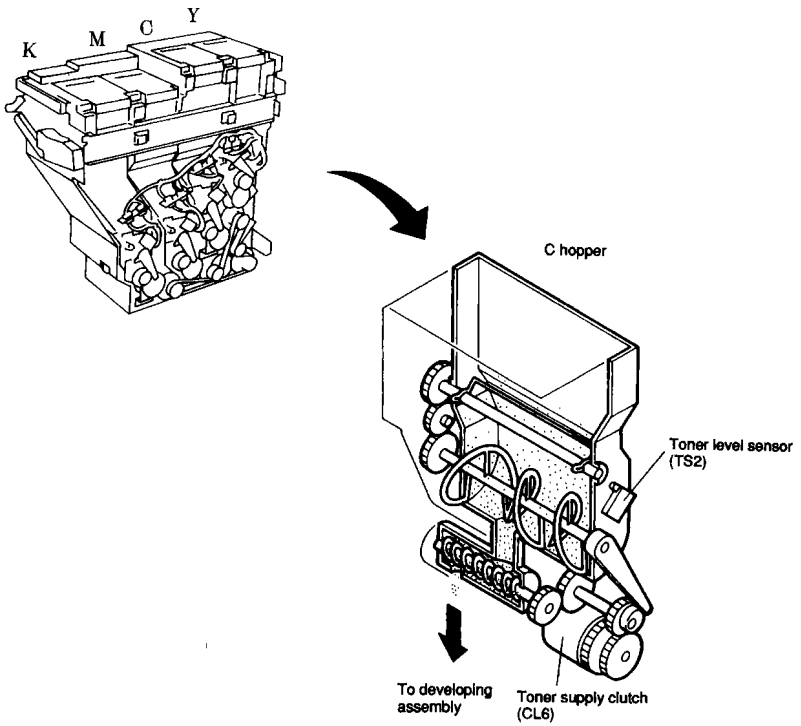


**Figure 3-543**

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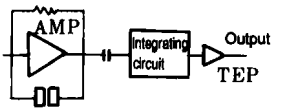
Table 3-505 shows the toner supply clutch and toner sensor intended for each developing assembly.

| | M | C | Y | Bk |
|---|---|---|---|---|
| Toner supply clutch | CL5 | CL6 | CL7 | CL8 |
| Toner level sensor | TS1 | TS2 | TS3 | TS4 |

**Table 3-505**

**Reference:**

The detecting unit of the toner sensor used in the hopper is a piezoelectric oscillator; it oscillates at several kHz in the absence of toner, causing the sensor output to be Low. In the presence of toner, the oscillation stops, causing the sensor output to be high.




Piezoelectric oscillator

**Figure 3-544**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## 6. Photosensitive Drum Cleaning

### a. Waste Toner Detection

The photosensitive drum cleaner is driven by the main motor (M4); the waste toner that has been scraped by the cleaning blade is forwarded to the waste toner container by a feeding screw for collection.

The level of waste toner is monitored by a waste toner sensor of a transmission type; when the level exceeds the specified level, the copier indicates the WASTE TONER message on the control panel.

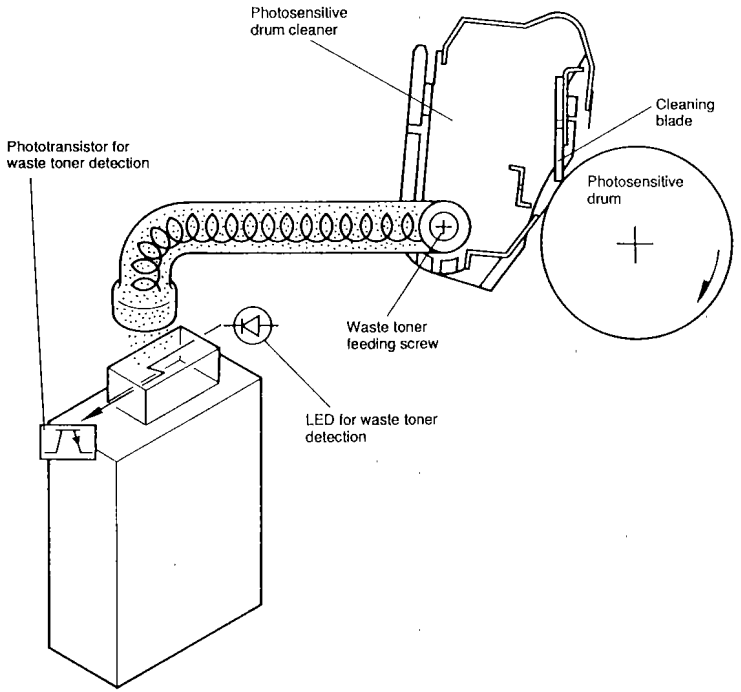


Figure 3-545

# VI. PICK-UP/FEEDING SYSTEM

## A. Outline

The copier uses the center reference feeding system, in which copy paper moves through the center of the pick-up feeding path.

The pick-up system of the CLC800 consists of cassette 1 (small size), duplexing unit, cassette 3, cassette 4 (large size), and multifeeder.

The pick-up system of the CLC700, on the other hand, consists of cassette 1 (small size), cassette 2 (large size), and multifeeder.

Copy paper picked up from a cassette or the multifeeder is moved to the registration roller.

When the registration roller has rotated, the retention roller becomes engaged and the retention corona assembly turns on to wrap the copy paper around the transfer drum.

In this condition, the toner image on the photosensitive drum is transferred to the copy paper; the transfer drum rotates a maximum of four times with copy paper wrapped around it.

If the copy paper is of a small size (182 to 216 mm), two sheets are kept on the transfer drum at a time to increase the copying speed.

When transfer is over, the copy paper is moved through the separation, feeding, and fixing assemblies before delivery to the copy tray.

Figure 3-601 and -602 are outline diagrams of the feeding paths of the CLC800 and CLC700.

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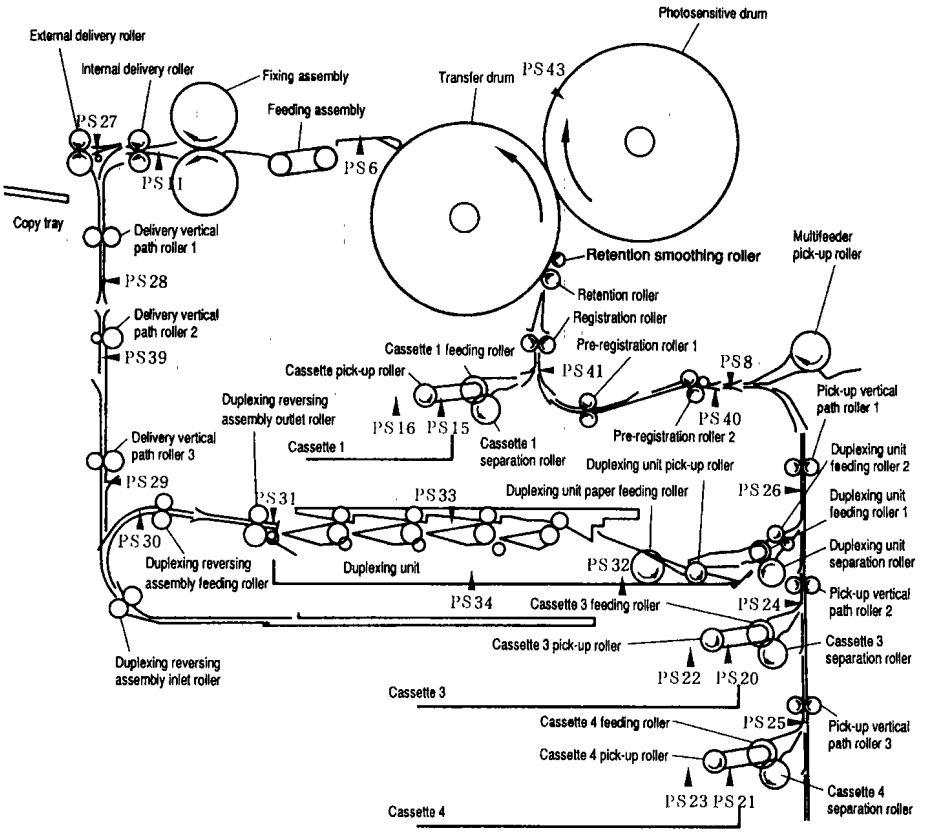


**Figure 3-601 CLC800**


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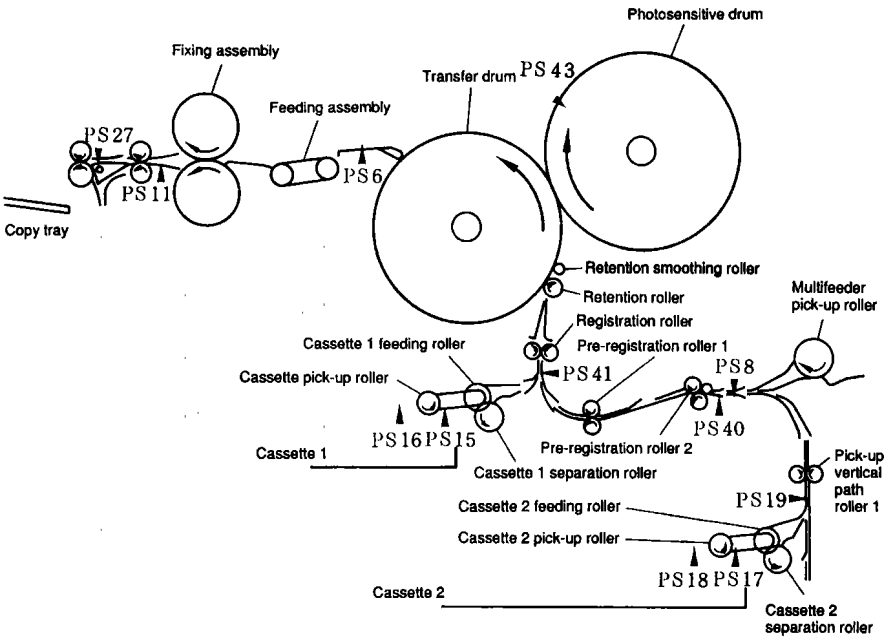


**Figure 3-602 CLC700**

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| Notation | Name | Notation | Name |
|---|---|---|---|
| PS8 | Multifeeder pick-up sensor | PS25 (CLC800) | Pick-up vertical path 3 sensor |
| PS11 | Internal delivery sensor | PS26 (CLC800) | Pick-up vertical path 1B sensor |
| PS14 | Multifeeder paper sensor | PS27 | External delivery sensor |
| PS15 | Cassette 1 lifter sensor | PS28 (CLC800) | Delivery vertical path 1 sensor |
| PS16 | Cassette 1 paper sensor | PS29 (CLC800) | Duplexing pre-reversal paper sensor |
| PS17 (CLC700) | Cassette 2 lifter sensor | PS30 (CLC800) | Duplexing post-reversal paper sensor |
| PS18 (CLC700) | Cassette 2 paper sensor | PS31 (CLC800) | Duplexing reversing unit outlet sensor |
| PS19 (CLC700) | Pick-up vertical path 1A sensor | PS32 (CLC800) | Duplexing stacking assembly paper sensor |
| PS20 (CLC800) | Cassette 3 lifter sensor | PS33 (CLC800) | Duplexing feeding assembly paper sensor |
| PS21 (CLC800) | Cassette 4 lifter sensor | PS34 (CLC800) | Paper jogging guide home positions sensor |
| PS22 (CLC800) | Cassette 3 paper sensor | PS39 (CLC800) | Delivery vertical path 2 sensor |
| PS23 (CLC800) | Cassette 4 paper sensor | PS40 | OHP sensor |
| PS24 (CLC800) | Pick-up vertical path 2 sensor | PS41 | Registration paper sensor |
| | | PS43 | Pre-photosensitive drum cleanner paper sensor |

**Table 3-601**


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# B. Pick-Up Assembly

## 1. Identifying the Size of Copy Paper

### a. Outline

The size of the copy paper inside the cassette is checked by the paper size sensor attached to the rear of the cassette holder.

When a cassette is inserted into a cassette holder, the paper size sensors are pushed by the bosses on the cassette, enabling identification of the width and length of the paper. The copier identifies the size of the paper size based on the combination of width and length of the paper and, at the same time, determines when the scanner must be reversed and how the laser exposure range must be controlled.

The bosses on the cassette used to push the paper size operate in conjunction with the guide plate inside the cassette; changing the location of the guide plate to suit the paper size automatically determines the paper size identified by the copier. (See Figure 3-604.)

### b. Identifying the Size of Copy Paper

The copy paper length sensor consists of two photointerrupters; the combination of the outputs of these two sensors makes identification of the length of paper possible.

On the other hand, the copy paper width sensor is a variable resistor, whose output resistance enables identification of the width of paper.

Figure 3-603 shows the relationship between paper widths and outputs of the variable resistor. The proportional relationship shown in the graph is stored in RAM on the DC controller PCB.

You must store the initial settings at the time you initialize the RAM on the DC controller whenever you have replaced the cassette, sensor, or DC controller. (See p. 3-278.)

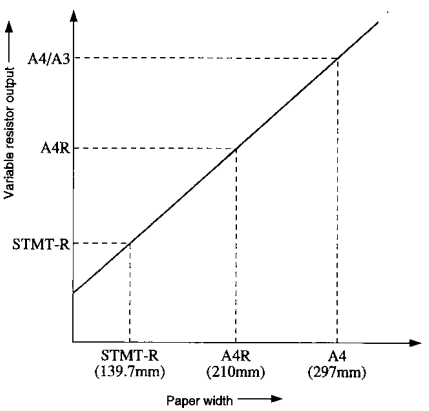
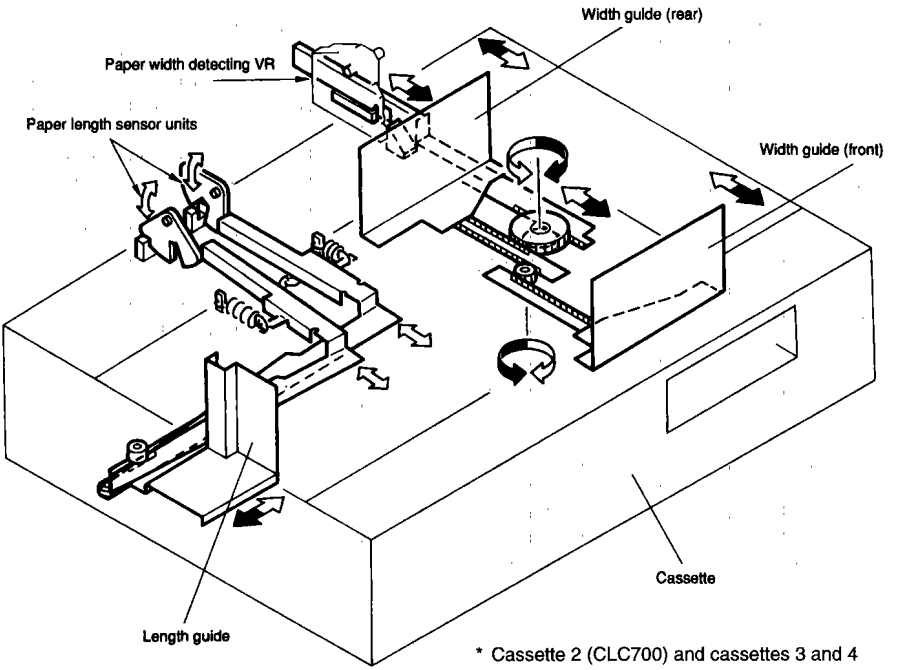



**Figure 3-603**




* Cassette 2 (CLC700) and cassettes 3 and 4 (CLC800) only.
Cassette 1 accommodates only a specific size of paper, and is not equipped with a paper length sensor unit.

**Figure 3-604**

**c. Marking on the Width Guide Rail**

The width guide rail found inside the cassette has holes used to determine paper size positions, and holes are identified with markings (A through M); see Table 3-602.

You may make use of these markings when making sure that the width guides are properly installed to suit the copy paper width in response to a call from the user noting skew movements of copy paper. (The markings are not made known to the user.)

| Markings | Paper | Remarks |
|---|---|---|
| A | STMT-R | |
| B | A5-R | |
| C | B5-R | |
| D | KLGL-R | |
| E | GLTR-R | |
| F | G-LGL | G3 |
| G | A4-R | |
| H | LGL/LTR-R | |
| I | FLSC | G2 |
| J | B4/B5 | |
| K | G-LTR | G1 |
| L | 11″ × 17″/LTR | G5 |
| M | A3/A4 | |

(For G1 through G5, see Table 3-604.)

**Table 3-602**

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**d. Paper Size**

The microprocessor on the DC controller determines the size of copy paper based on paper width/length input.

| Paper length sensor / Paper width sensor slice level (in mm) | PS101 PS103 PS105 | PS102 PS104 PS106 | PS101 PS103 PS105 | PS102 PS104 PS106 | PS101 PS103 PS105 | PS102 PS104 PS106 | PS101 PS103 PS105 | PS102 PS104 PS106 |
|---|---|---|---|---|---|---|---|---|
| Signal | SZ0 | SZ1 | SZ0 | SZ1 | SZ0 | SZ1 | SZ0 | SZ1 |
| ON/OFF | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 288.5 | A4 | | — | | A3 | | — | |
| 273.7 | (G5) | | — | | 11″ × 17″ | | — | |
| 261.8 | (G1) | | — | | — | | — | |
| 238.0 | B5 | | — | | B4 | | — | |
| 212.9 | STMT | | LTRR | | LGL | | (G2) | |
| 206.6 | A5 | | A4R | | — | | (G3) | |
| 196.6 | G-LTRR | | — | | — | | | |
| 186.0 | K-LGLR | | — | | — | | — | |
| 165.2 | B5R | | — | | — | | — | |
| 144.1 | A5R | | — | | — | | — | |
| | STMTR | | — | | — | | — | |

**Table 3-603**

The sizes shown in Table 3-604 are specified in service mode for each group of paper sizes.

The asterisk (*) indicates the size specified at the factory.

| Group | Size | |
|---|---|---|
| G1 | * | G-LTR<br>K-LGL |
| G2 | * | FOOLSCAP<br>OFFICIO<br>E-OFFI<br>A-LGL<br>A-OFFI |
| G3 | * | G-LGL<br>FOLIO<br>AUS-FLS |
| G5 | * | LTR<br>A-LTR |

**Table 3-604**

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**e. Paper Sizes**

Table 3-605 shows the sizes of copy paper that may be used in the CLC700 and CLC800.

The CLC700 uses cassette 1 (small size) and cassette 2 (large size).

The CLC800 uses cassette 1 (small size), duplexing unit, cassette 3, and cassette 4 (large size).

You may place only A4 or LTR paper in the small size cassette.

You may place all paper that may be accommodated by the copier in the large size cassette and multifeeder tray.

You may place transparency in any cassette, but you may place postcard (special), label sheet (special), or thick paper (106 to 163 g/m$^2$) only in the multifeeder.

| Paper | Notation | Size (vertical × horizontal; in mm) |
|---|---|---|
| A3 | A3 | (297±1) × (420±1) |
| A4R | A4R | (210±1) × (297±1) |
| A4 | A4 | (297±1) × (210±1) |
| B4 | B4 | (257±1) × (364±1) |
| B5R | B5R | (182±1) × (257±1) |
| B5 | B5 | (257±1) × (182±1) |
| 11″ × 17″ | 11×17 | (279±1) × (432±1) |
| LETTER R | LTRR | (216±1) × (279±1) |
| LETTER | LTR | (279±1) × (216±1) |
| LEGAL | LGL | (216±1) × (356±1) |

**Table 3-605**

**f. Storing Paper Width Default Settings**

See p. 3-278

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## 2. Cassette Pick-Up Assembly

### a. Operation

The pick-up assembly of the CLC800 and CLC700 has a construction shown in Figure 3-605 and -606.

The cassette is capable of accommodating as many as 500 sheets of copy paper (80 g/m$^2$).

The copy paper inside the cassette is lifted by the lifter, whereupon it comes into contact with the pick-up roller.

When the pick-up clutch turns on, the pick-up roller rotates to forward the copy paper; then, the pick-up roller solenoid turns on, and the pick-up roller moves away from the paper.

The paper then moves past the pick-up vertical path roller and pre-registration roller until it reaches the transfer drum by way of the registration roller.

See Table 3-606 for the notations of the pick-up clutch and pick-up roller solenoid of each of the cassettes used in the CLC800 and CLC700.

| Cassette / Name | Multifeeder | Cassette 1 | Cassette 2 (CLC700) | Cassette 3 (CLC800) | Cassette 4 (CLC800) | Duplexing unit (CLC800) |
|---|---|---|---|---|---|---|
| Pick-up clutch | CL12 | CL13 | CL14 | CL16 | CL17 | CL19 |
| Pick-up roller solenoid | SL15 | SL16 | SL17 | SL18 | SL19 | SL21 |

**Table 3-606**

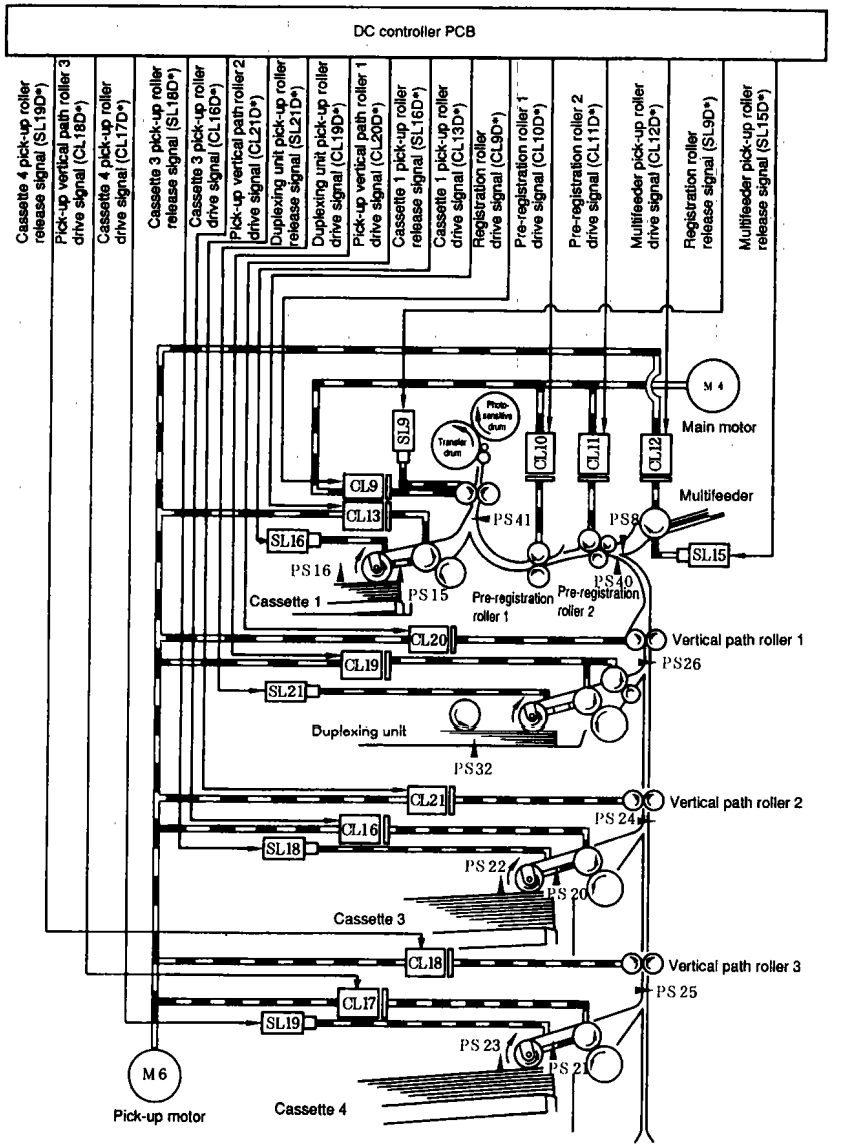


**Figure 3-605 CLC800 Pick-Up Assembly**


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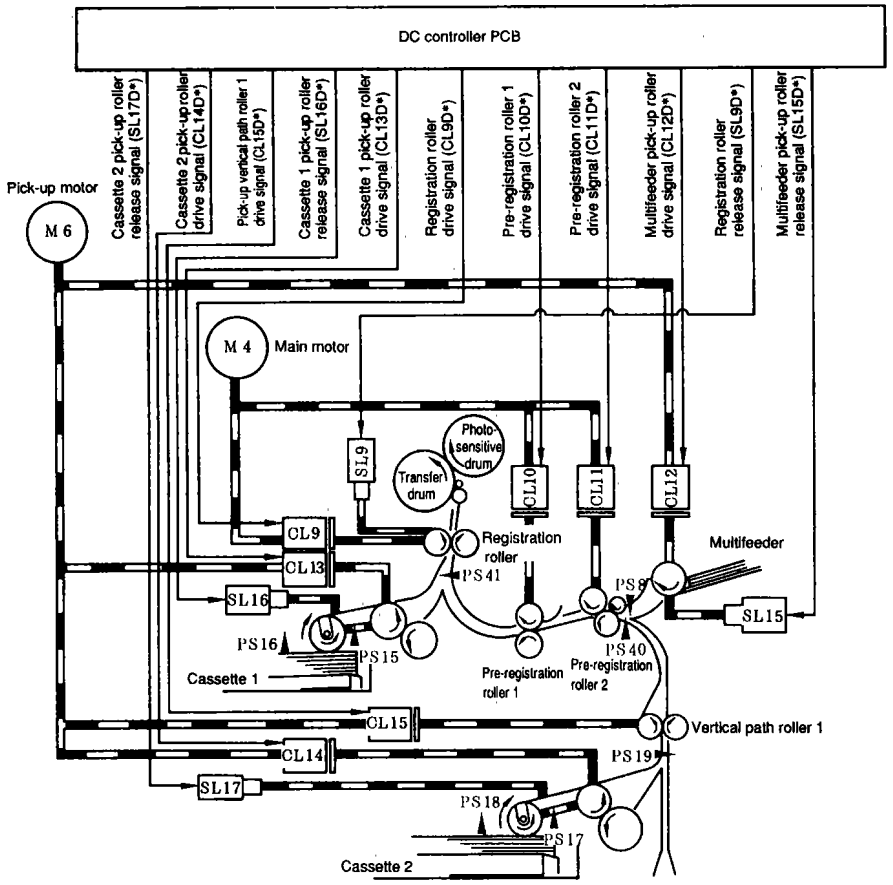


**Figure 3-606 CLC700 Pick-Up Assembly**

**b. Cassette Lifter Operation**

Figures 3-607 and -608 are outline diagrams of the cassette lifter operation.

When the cassette is inserted into the copier, the pick-up roller lowers, and the light-blocking plate leaves the lifter position sensor.

This condition causes the lifter motor to turn on, raising the lifter; then, the lifter motor stops where the lifter position sensor can detect the face of the stack of copy paper on the lifter.

When copy paper runs out and the paper detecting lever leaves the paper sensor, the copier indicates the Add Paper message on the control panel.

Table 3-607 shows the notations used for the lifter motor, lifter position sensor, and paper sensor as used for each of the cassettes in the copier.

| Cassette / Notation | Cassette 1 | Cassette 2 (CLC700)* | Cassette 3 (CLC800) | Cassette 4 (CLC800) |
|---|---|---|---|---|
| Lifter motor | M12 | M13 | M14 | M15 |
| Lifter position sensor | PS15 | PS17 | PS20 | PS21 |
| Paper sensor | PS16 | PS18 | PS22 | PS23 |

*For the duplexing unit (CLC800), see p. 3-134.

**Table 3-607**

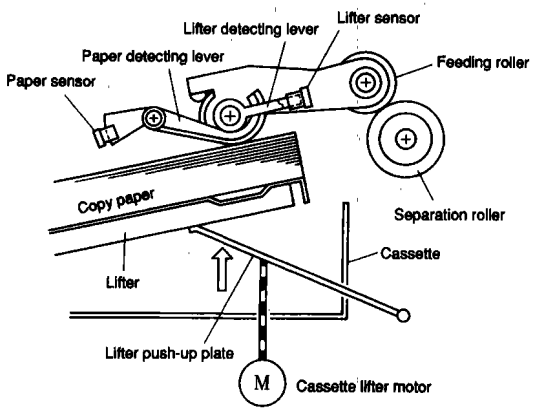


**Figure 3-607**


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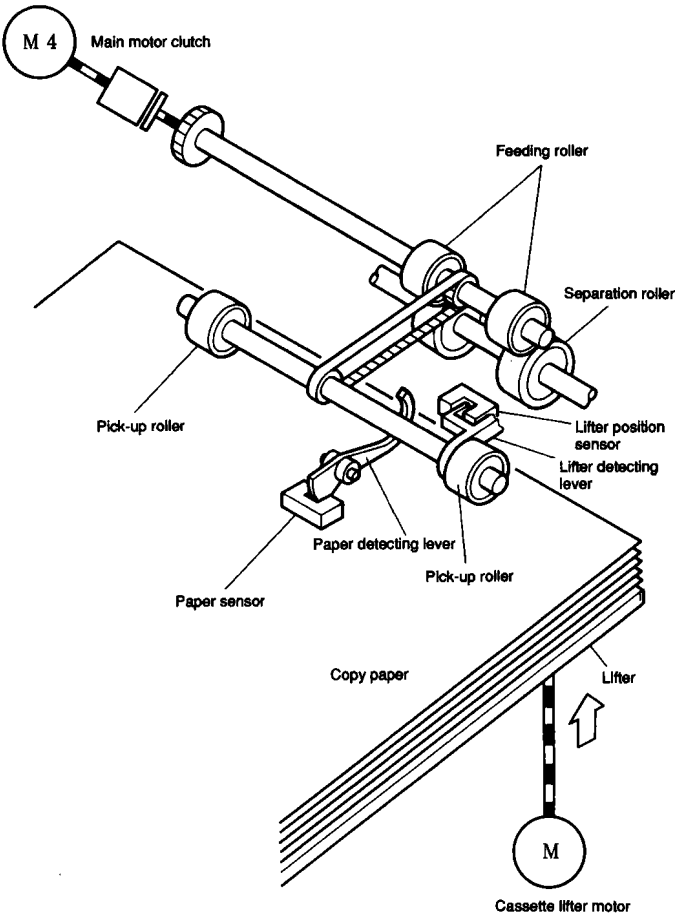
M 4
Main motor clutch
Feeding roller
Separation roller
Pick-up roller
Lifter position sensor
Lifter detecting lever
Paper detecting lever
Pick-up roller
Paper sensor
Copy paper
Lifter
M
Cassette lifter motor

Figure 3-608

### c. Sequence of Pick-Up Operations

① Cassette 1, A4, 2 Copies Continuous, 4-Color, DIRECT

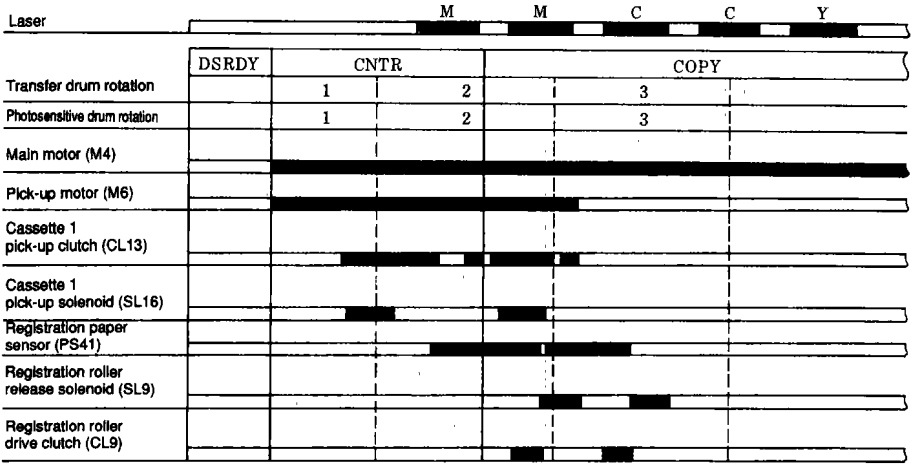


**Figure 3-609**


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② Cassette 3, A4, 2 Copies Continuous, 4-Color, DIRECT

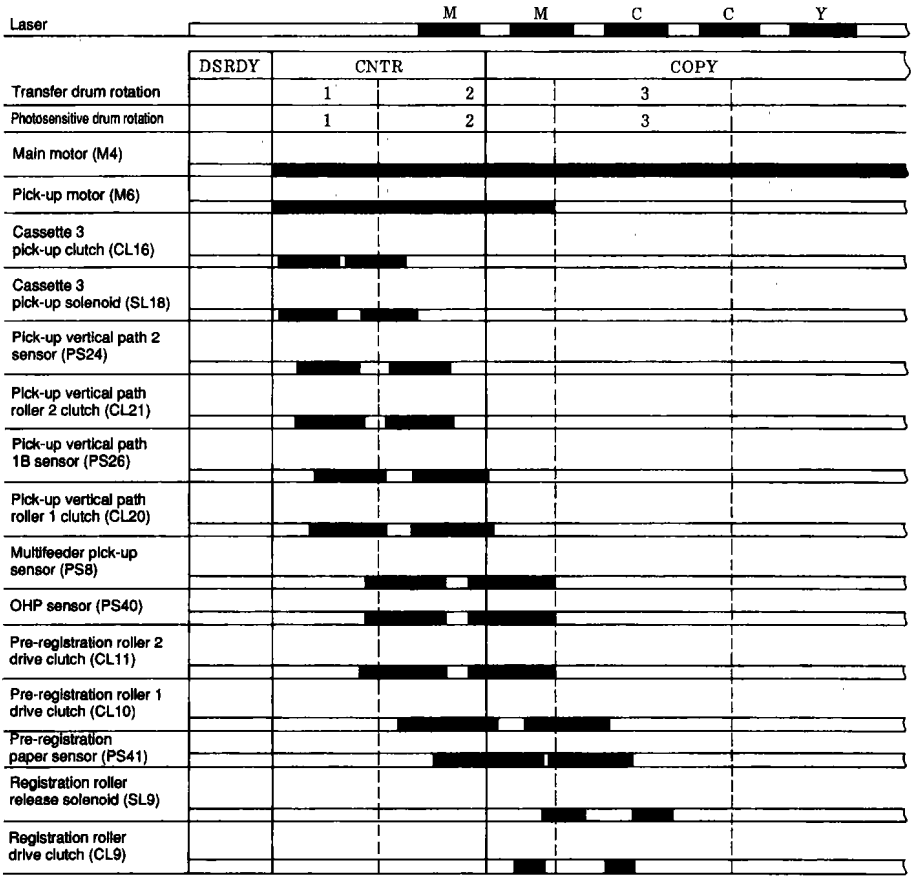


Figure 3-610

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## 3. Multifeeder Pick-Up Assembly

### a. Operation

The multifeeder pick-up assembly is constructed as shown in Figure 3-611.

The multifeeder is designed so that paper is picked up from its tray and is also capable of accommodating continuous feeding.

As many as 50 sheets of copy paper (80 g/m²) may be stacked on its tray.

The presence of copy paper on the tray is checked by the multifeeder paper sensor (PS14).

The copy paper stacked on the tray is butted against the pick-up roller by the paper guide plate.

The pick-up roller starts to rotate when the drive of the pick-up motor (M6) is transmitted through a clutch.

Only one sheet of copy paper is forwarded by the work of the pick-up roller and the separation pad to the registration roller through the pre-registration roller.

The above series of operations is repeated for each pick-up.

Thick paper fed through the multifeeder is identified when the user select 'Thick Paper' on the touch panel.

For transparencies, see p. 3-133.

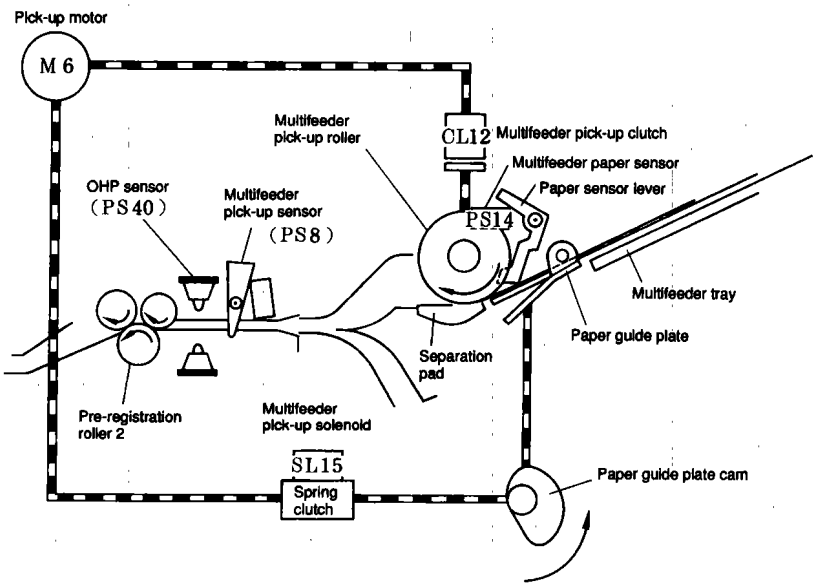


Figure 3-611


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**b. Identifying the Size of Copy Paper in the Multifeeder**

The paper width guide plate of the copier's multifeeder tray is equipped with a variable resistor; the width of paper is identified when the guide plate is butted against the edge of the stack of copy paper. (See Figure 3-612.)

In addition, the length of copy paper in manual mode is identified by the period of time during which the multifeeder pick-up sensor (PS8) remains on.

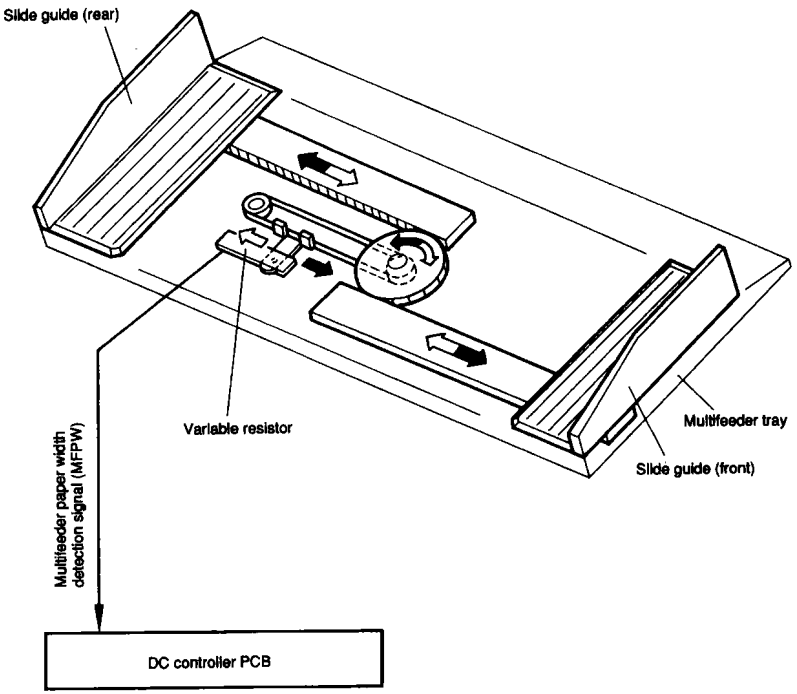


Figure 3-612

**c. Sequence of Pick-Up Operations**

Multifeeder, A4, 4-Color, DIRCT

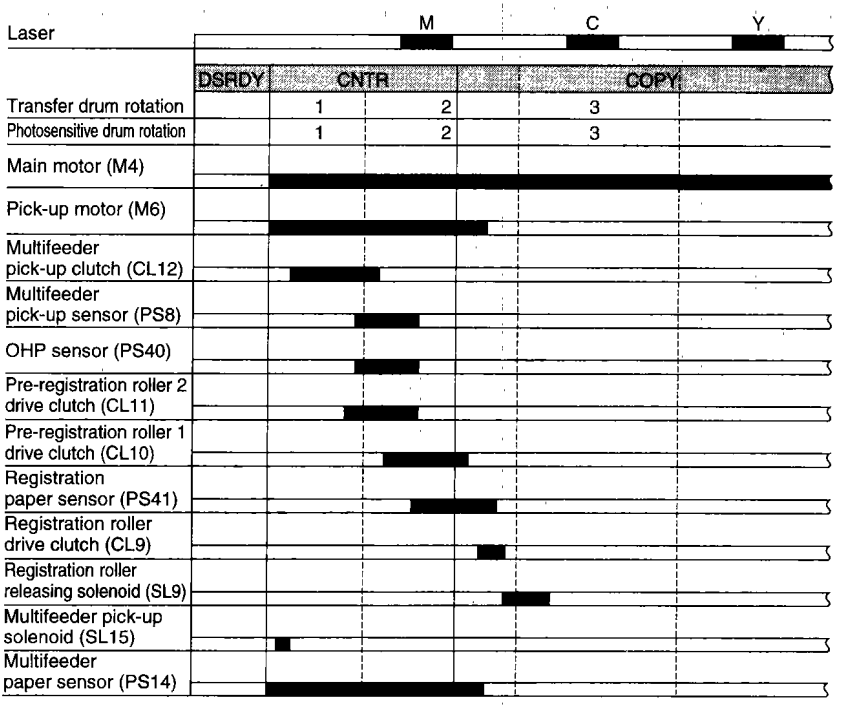


**Figure 3-613**


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## 4. OHP Film Pick-Up

Like plain paper, you can place transparencies in the multifeeder, cassette 1, cassette 2, cassette 3, or cassette 4.

If transparencies are set in the multifeeder, cassette 2, cassette 3, or cassette 4, the OHP sensor (PS40) identifies whether the material is transparencies or otherwise.

If transparencies are stacked in cassette 1, the registration paper sensor (PS41) is used to identify whether the paper is a transparency or otherwise.

If the copier identifies the material as transparencies, it switches the speed of the fixing assembly.

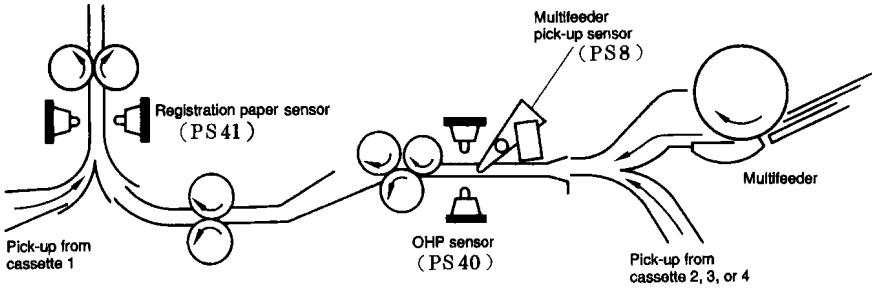


**Figure 3-614**

**Reference:**

1. Advise the user to place one sheet of thick paper (to serve as backing paper) inside the cassette before stacking transparencies.
2. Advise the user to separate each transparency before stacking them in the cassette or the multifeeder.

# C. Duplexing Unit

## 1. Outline

After the fixing process, copy paper picked up from the cassette or multifeeder is forwarded to the delivery vertical path assembly by the delivery paper deflecting plate; then, it is moved to the duplexing feeding assembly located inside the duplexing unit.

In the duplexing feeding assembly, the four paper deflecting plates form an appropriate path according to the length of the paper, and the paper is moved farther to the duplexing stacking assembly.

In addition, a duplexing stacking assembly heater is provided to prevent curling of copy paper.

Figures 3-615 and -616 show outline diagrams of the duplexing unit and its basic operations.

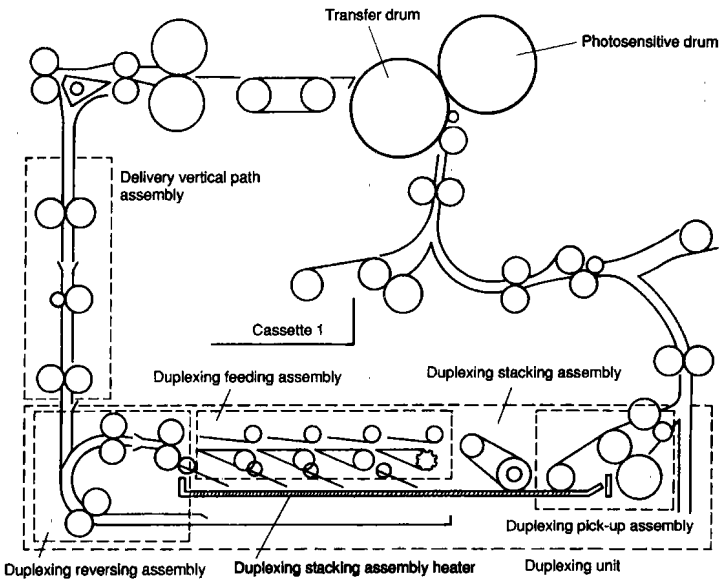


Figure 3-615

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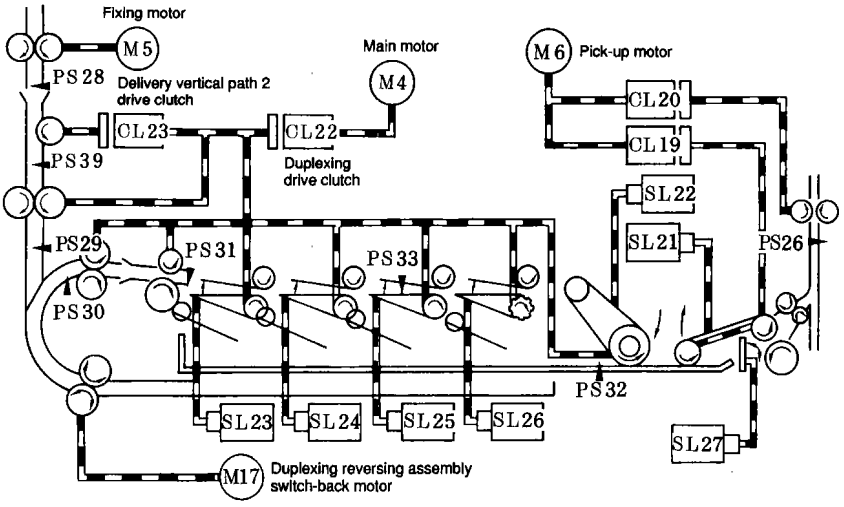
Fixing motor
M5
PS28
Delivery vertical path 2 drive clutch
CL23
CL22
Main motor
M4
Duplexing drive clutch
M6
Pick-up motor
CL20
CL19
PS39
SL22
SL21
PS26
PS29
PS31
PS33
PS30
PS32
SL23
SL24
SL25
SL26
SL27
M17
Duplexing reversing assembly switch-back motor

Figure 3-616

## 2. Stacking Two-Sided Copies

When making one two-sided copy, the copier's delivery deflecting plate shifts up to move paper as far as the duplexing reversing assembly.

Then, when the reversing roller rotates in reverse, the path formed by the deflecting sheet carries the copy paper to the duplexing unit feeding assembly, thereby reversing the copy paper.

The pick-up roller inside the duplexing unit rises, and the stopper plate shifts up, waiting for the copy paper.

When the copy paper reaches inside the duplexing unit stacking assembly, the feeding roller lowers to butt the copy paper against the stopper plate.

At this time, the copy paper is held in place by the pick-up roller; moreover, the curl pressing sheet or the curl pressing roller keeps the curl on the trailing edge of the copy paper down; see sections d and e.

When the last copy paper is stacked, the stopper plate shifts down, and the pick-up roller starts pick-up operation.

Figures 3-617 and -618 are outline diagrams of the stacking operation that takes place in the duplexing unit.

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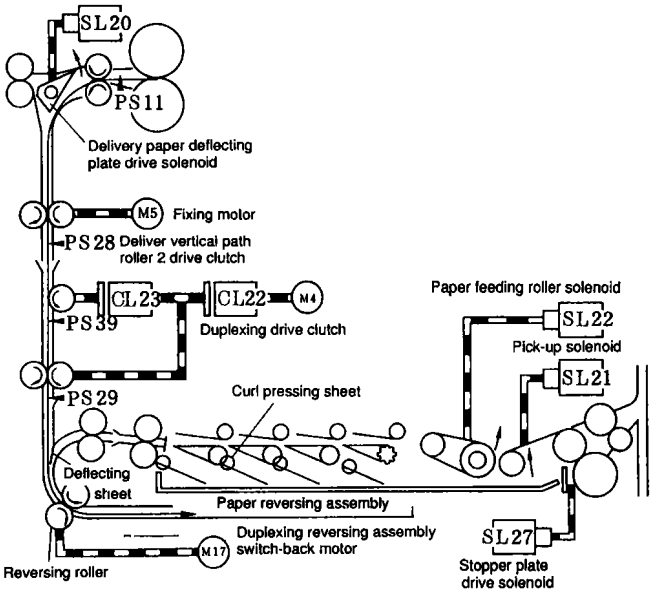


Figure 3-617

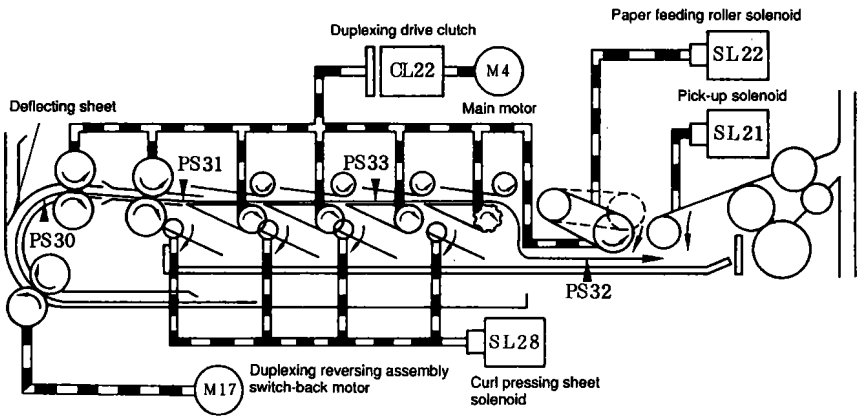


Figure 3-618

## 3. Changing the Paper Path in the Duplexing Feeding Assembly

The paper path in the duplexing feeding assembly is changed in two-sided copy mode to suit the size of copy paper.

As many as five different paths may be formed, each formed by four paper deflecting plate.

Each of the paper deflecting plate is driven by its respective solenoid.

| Ref. No. | Paper length | Typical paper size | Paper deflecting plate drive solenoid | | | |
|---|---|---|---|---|---|---|
| | | | SL23 | SL24 | SL25 | SL26 |
| ① | 443.83 mm<br>390.57 mm | 11″ × 17″<br>A3 | ON | OFF | OFF | OFF |
| ② | 368.92 mm<br>315.66 mm | B4<br>LGL | OFF | ON | OFF | OFF |
| ③ | 299.58 mm<br>246.32 mm | A4R<br>LTR-R | OFF | OFF | ON | OFF |
| ④ | 231.54 mm<br>178.28 mm | LTR<br>A4<br>B5R | OFF | OFF | OFF | ON |
| ⑤ | 163.50 mm<br>128.15 mm | B5 | OFF | OFF | OFF | OFF |

**Table 3-608**

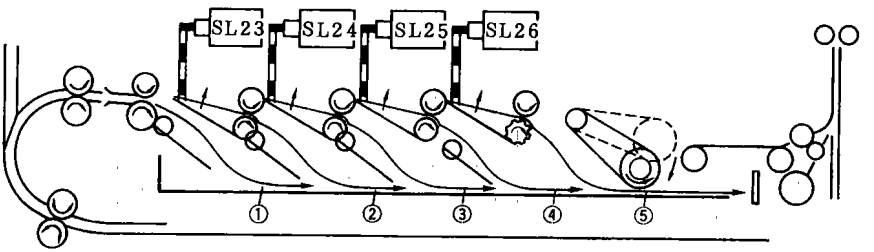


**Figure 3-619**


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## 4. Curl Pressing Sheet

In the copier, curling of copy paper inside the duplexing unit could cause a stacking fault when sheets are stacked in two-sided copy mode.

To prevent such a fault, curl pressing sheets are used to hold down the trailing edge of copy paper, thereby ensuring proper stacking of the following paper.

Eight curl pressing sheets (2 × 4) are found inside the duplexing unit, and different pressing sheets are used according to the size of copy paper (see Figure 3-619; see the next section of ⑤); each time a sheet of copy paper arrives, all curl pressing sheets make a single rotation.

See Figure 3-620 for the sequence of operations.

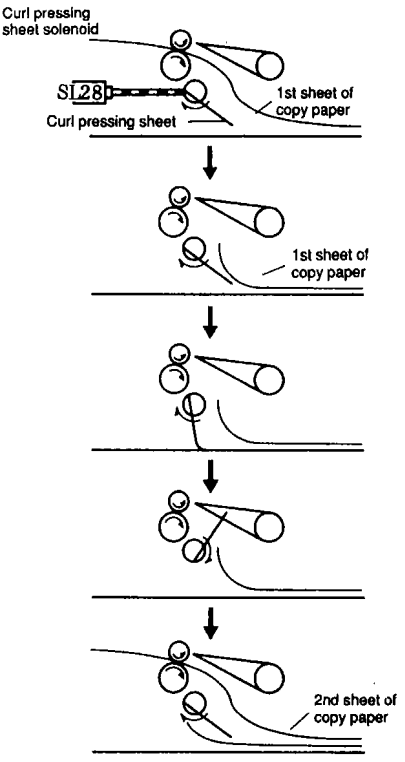


Figure 3-620

## 5. Stacking Operation in Path ⑤

If copy paper moves along path ⑤ (p. 3-138) and is stacked inside the duplexing unit, a curl pressing gear is used instead of a curl pressing sheet to hold down the trailing edge of the copy paper, ensuring the proper stacking of the next copy paper.

See Figure 3-621 for stacking operation that takes place in path ⑤.

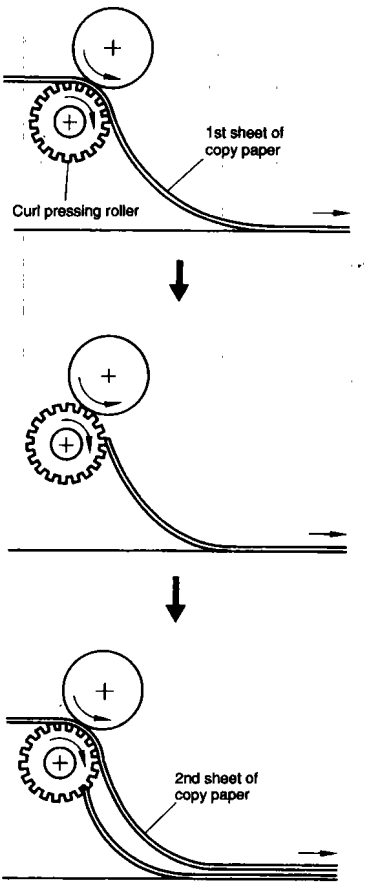


Figure 3-621


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## 6. Paper Jogging Guide Plate

### a. Outline

The paper jogging guide plate is used to keep the stack of copy paper in the duplexing stacking assembly in order, thereby preventing skew movements or jams at time of pick-up.

Each time a sheet of copy paper arrives, the paper jogging guide plate moves to come into contact with the edge of the paper.

### b. Paper Jogging Operation

When the Copy Start key is pressed in two-sided copy mode, the duplexing stacking guide motor (M16) starts to move in reverse to move the paper jogging guide plate in the direction of the arrow shown in Figure 3-622.

The motor stops as soon as the light-blocking plate of the paper jogging guide plate blocks the guide home position sensor (PS34) of the duplexing stacking assembly.

The DC controller PCB sends the number of pulses that corresponds to the size of the copy paper.

In response, the motor rotates in normal direction to move the paper jogging guide plate to a point that suits the size of the paper used. Next, the motor starts to rotate in reverse to move and stop the paper jogging guide plate at a point about 8 mm (one side) away from the width of the copy paper; the paper jogging guide waits for the copy paper at this point.

When the copy paper arrives in the duplexing unit stacking assembly, the motor rotates in normal direction to move the guide plate by 8 mm and then rotates in reverse to move the guide plate by 8 mm to put the paper in line.

When the last copy paper arrives, the motor rotates in normal direction, in reverse, and in normal direction to be ready for copying on the second side.

The motor remains at rest during copying on the second side; it remains at rest until the next copying operation starts for the first side.

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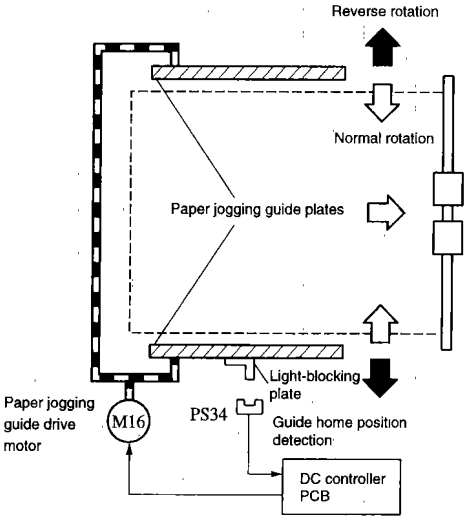


**Figure 3-622 Tray (top view)**

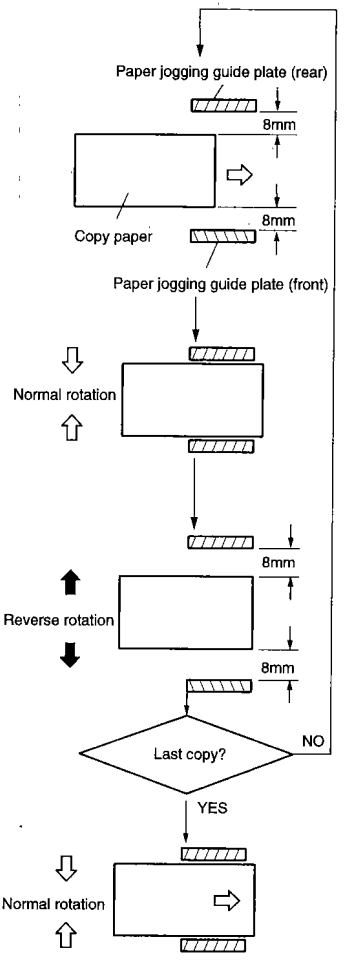


**Figure 3-623 Paper Jogging Operation**


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**c. Sequence of Copying Operations (two-sided, 1st side)**

Two-Sided (1st side), A4, 2 Copies Continuous, 4-Color, DIRECT

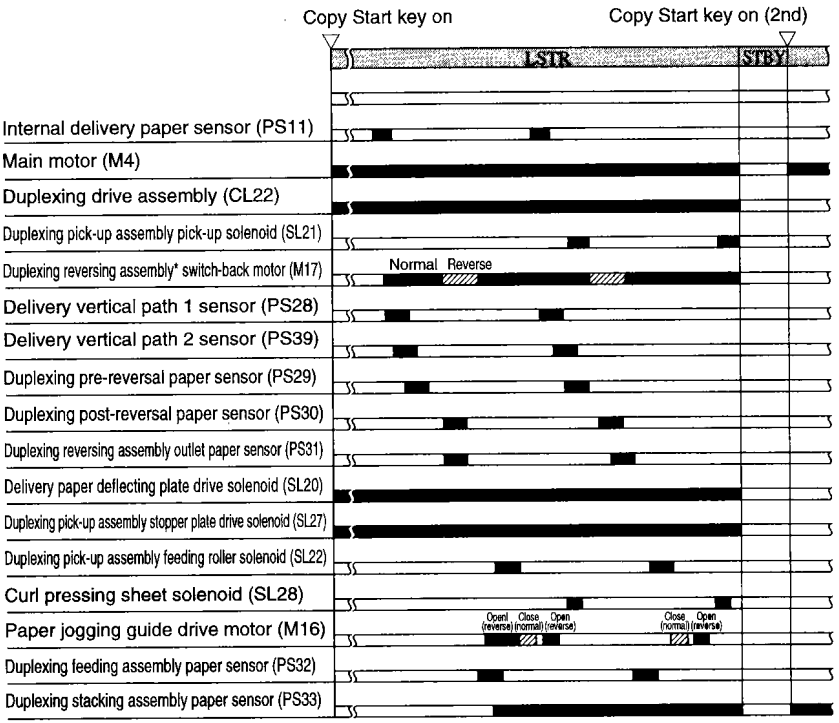
Copy Start key on
Copy Start key on (2nd)
LSTR
STBY
Internal delivery paper sensor (PS11)
Main motor (M4)
Duplexing drive assembly (CL22)
Duplexing pick-up assembly pick-up solenoid (SL21)
Duplexing reversing assembly* switch-back motor (M17)
Normal
Reverse
Delivery vertical path 1 sensor (PS28)
Delivery vertical path 2 sensor (PS39)
Duplexing pre-reversal paper sensor (PS29)
Duplexing post-reversal paper sensor (PS30)
Duplexing reversing assembly outlet paper sensor (PS31)
Delivery paper deflecting plate drive solenoid (SL20)
Duplexing pick-up assembly stopper plate drive solenoid (SL27)
Duplexing pick-up assembly feeding roller solenoid (SL22)
Curl pressing sheet solenoid (SL28)
Paper jogging guide drive motor (M16)
Open (reverse)
Close (normal)
Open (reverse)
Close (normal)
Open (reverse)
Duplexing feeding assembly paper sensor (PS32)
Duplexing stacking assembly paper sensor (PS33)

**Figure 3-624**

*1 A4 Paper
- Normal rotation .....high-speed control
- Reverse rotation .....high-speed control

A3 Paper
- Normal rotation .....low-speed control (delivery vertical path 2 sensor detects paper)
- Normal rotation .....high-speed control (trailing edge of paper has moved past delivery vertical path 2 sensor)
- Reverse rotation .....high-speed control

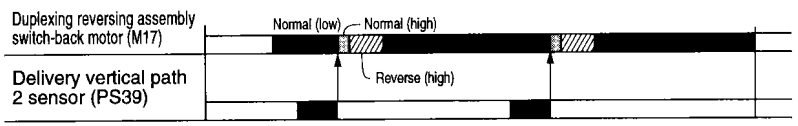


**Figure 3-625**

## 7. Pick-Up from the Duplexing Unit

### a. Outline

When copying on the second side of a two-sided copy, the appropriate paper stacked inside the duplexing unit stacking assembly is picked up.

When the Copy Start key is pressed, the stopper plate shifts down, and the duplexing unit pick-up clutch (CL19) turns on, thereby transmitting the drive of the pick-up motor (M6) to the pick-up roller to pick up copy paper. After pick-up, the pick-up roller moves away from the paper by the action of the pick-up roller solenoid (SL21).

Then, one of the sheets of copy paper is moved to the vertical path assembly by the feeding roller and separation roller.

Figure 3-626 shows an outline of the pick-up operation that takes place in the duplexing unit.

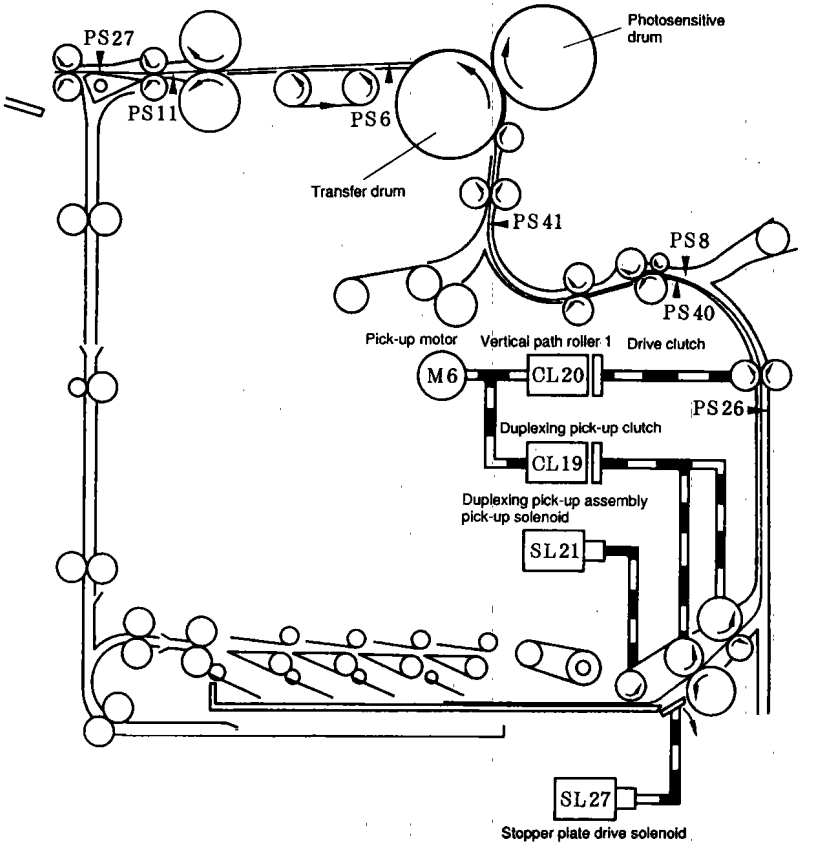


Figure 3-626


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### b. Sequence of Pick-Up Operations (duplexing unit)

Duplexing unit, A4, 2 Copies Continuous, 4-Color, DIRECT

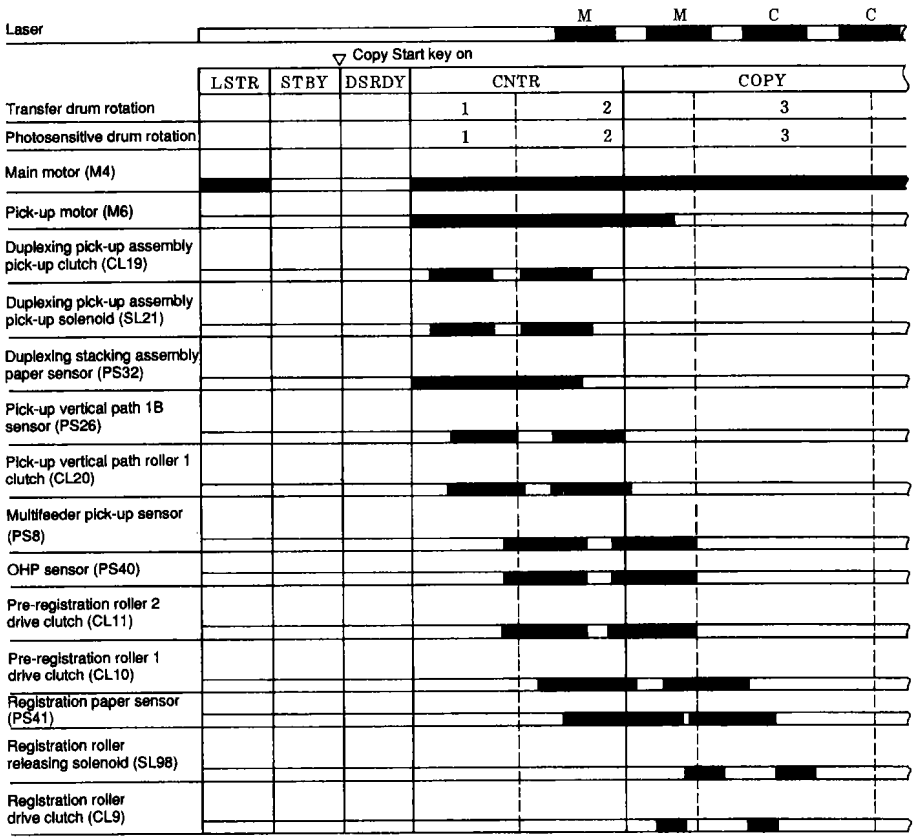


Figure 3-627

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# D. Controlling Registration and Retention

## 1. Outline

After pick-up, the copy paper is made to form an arc against the registration roller for correcting any skew, and is moved to the retention roller by the registration roller; the retention roller then puts and holds the copy paper on the transfer sheet. The rotation of the registration roller and the rotation of the engaging/releasing roller, and retention roller are driven by the drive of the main motor through their respective solenoids/clutches.

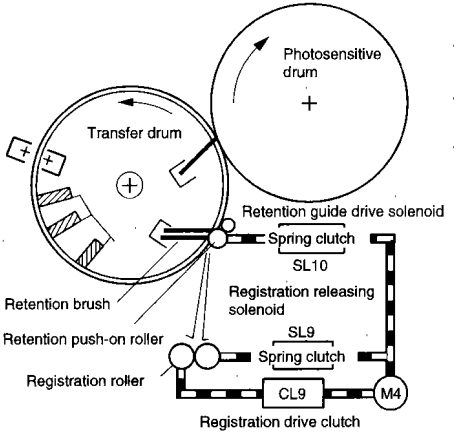


Figure 3-628

## 2. Releasing the Registration Roller

When the copy paper sent by the registration roller is placed on the transfer drum sheet, the registration releasing solenoid (SL9) turns on, thereby causing the registration engaging cam to rotate and releasing the registration link roller from the registration roller by the drive of the main motor.

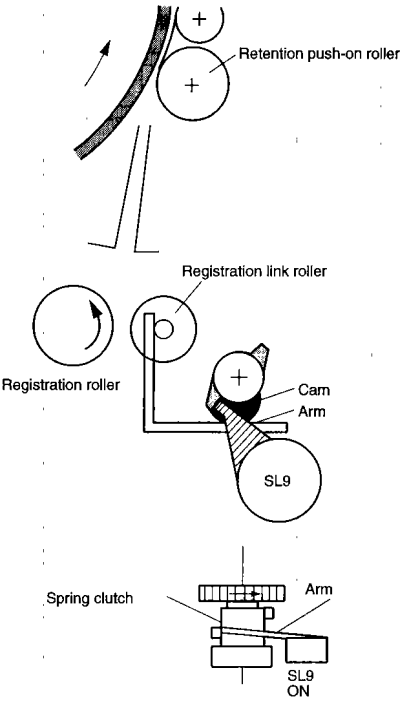


Figure 3-629


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### 3. Retention Roller

The copier's transfer drum does not have a gripper, and copy paper is held to the transfer drum by means of static electricity.

During copying operation, the retention guide drive solenoid (SL10) remains on as long as the length of the copy paper, thereby keeping the retention roller in contact with the transfer drum sheet. At this time, the retention brush turns on to keep the copy paper on the transfer drum sheet by means of static electricity.

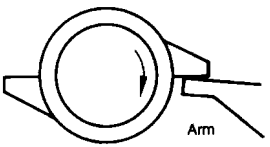


**Figure 3-630 Control Cam (rear view)**

**Reference:**

1. When making a mono-color copy, the paper is separated before making a full rotation; for this reason, SL10 does not turn off during copying operation but remains on.
2. When two sheets of copy paper is retained, SL10 does not turn off over the gap between the two sheets.

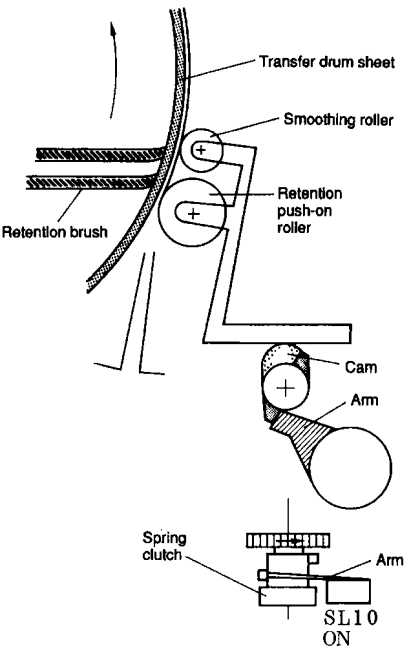


**Figure 3-631**

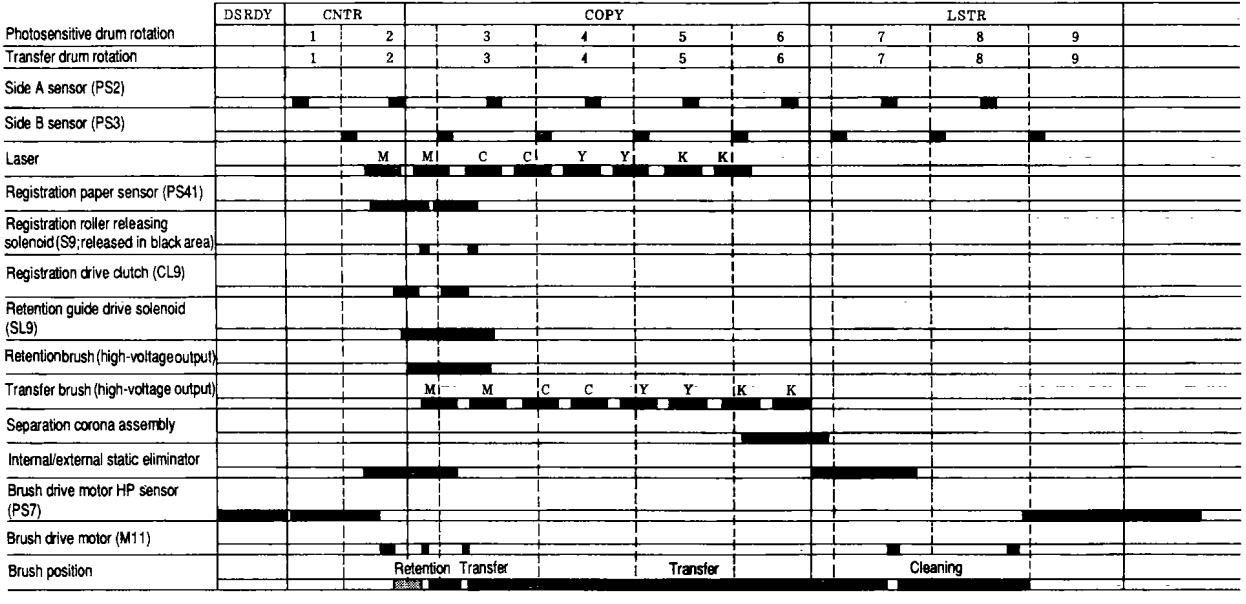


**Figure 3-632 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Potential Control**



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# E. Transfer Drum

## 1. Outline

The transfer drum is constructed as shown in Figure 3-633.

The transfer drum keeps copy paper on the transfer sheet by means of static electricity, and makes as many as four rotations; then, it moves the copy paper to the fixing assembly.

The transfer drum is butted against the photosensitive drum by the work of the main motor (M4) and cam when the transfer drum drive solenoid (SL13) is on. The transfer drum is rotated by the drive of the drum motor (M2) by way of the rotation of the photosensitive drum.

The feeding belt and registration roller, on the other hand are driven by the main motor (M4).

The transfer drum cleaner is engaged by the transfer drum cleaner solenoid (SL14), and is driven by the transfer drum cleaning brush motor (M10).

When the oil removing roller is driven by the main motor when the transfer drum cleaner solenoid (SL14) and oil removing roller solenoid (SL11) turn on; the polishing roller is driven by the polishing roller motor (M18).

Each of the brushes inside the transfer drum is driven by the brush drive motor.

The separation claw and separation push-up roller are each driven by separate solenoids.

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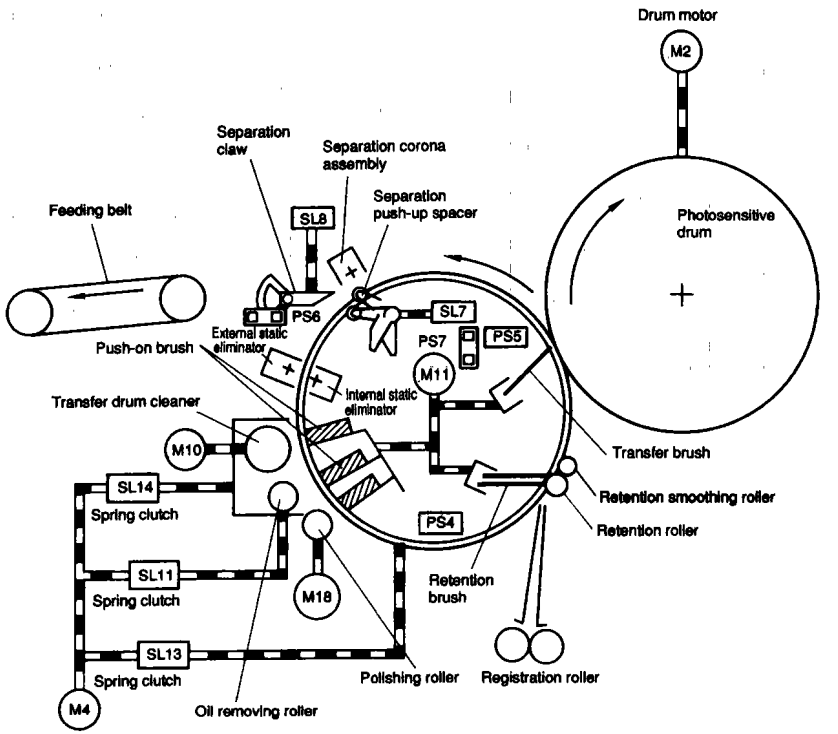


PS4: Pre-transfer paper sensor
PS5: Post-transfer paper sensor
PS6: Separation sensor
PS7: Brush drive motor HP sensor
SL7: Separation push-up solenoid
SL8: Separation claw drive solenoid
SL11: Oil removing roller solenoid
SL13: Transfer drum drive solenoid
SL14: Transfer drum cleaner solenoid
M2: Drum motor
M4: Main motor
M10: Transfer drum cleaning brush motor
M11: Brush drive motor
M18: Polishing roller motor

**Figure 3-633**

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## 2. Controlling the Engagement of the Brushes Inside the Transfer Drum

Inside the transfer drum are found the retention brush, transfer brush, and push-on brush for cleaning. Each of the brushes are away from the transfer drum sheet standby, and they are engaged as necessary with the transfer drum sheet by their respective engaging cams. As shown in Figure 3-634, the three engaging cams are rotated by the drive of the brush drive motor (M11).

Figure 3-635,-636,-637 is a diagram showing the state of each brush and cam.

The copier's brush drive motor is a stepping motor, which controls the rotation of the cams to drive the brushes by applying specific pulses to the brush drive motor after the DC controller PCB has detected that the brush drive motor is at its home position by the brush drive motor HP sensor (PS7).

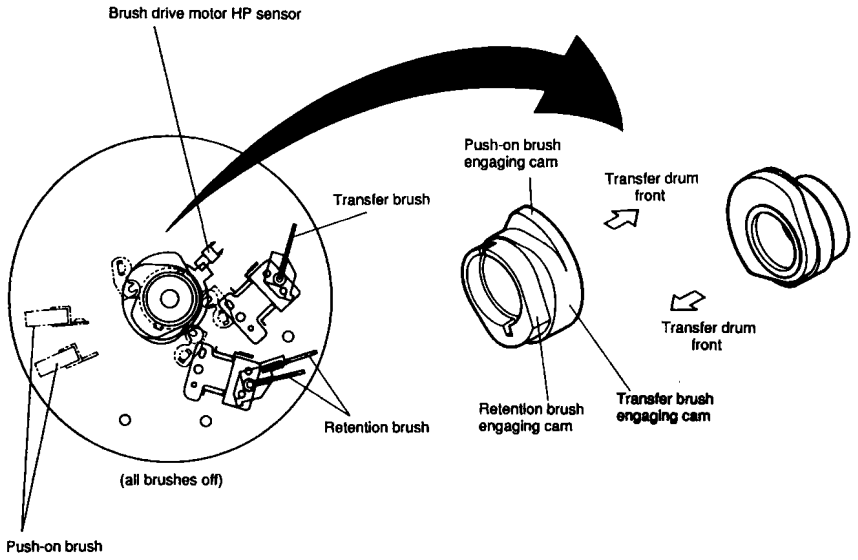



**Figure 3-634**

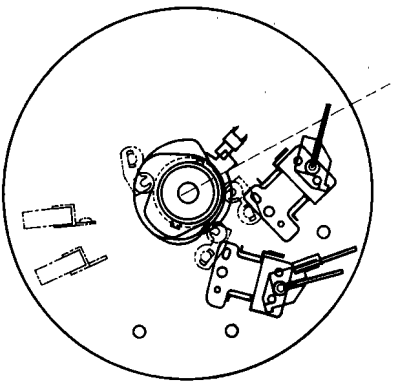
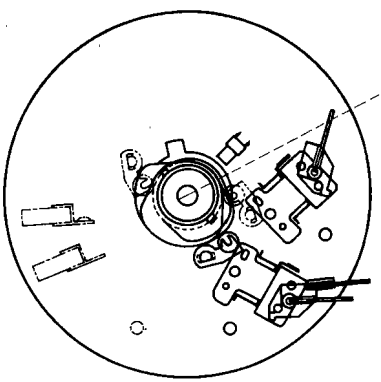
| | |
|---|---|
| Home position  | All brushes, i.e., retention brush, transfer brush, and push-on brush are off. |
| Retention  | The retention brush is on; the transfer brush and push-on brush are off. |

**Figure 3-635**

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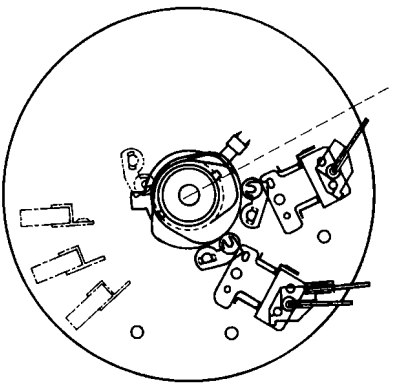
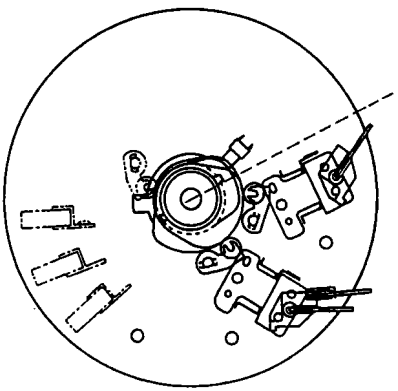
| | |
|---|---|
| Transfer of 1st color  | The retention brush and transfer brush are on; the push-on brush is off. |
| Transfer of 2nd to 4th colors  | The retention brush/transfer brush turns on, and the push-on brush turns off; however, the retention brush turns off if LTR-R is selected. |

**Figure 3-636**

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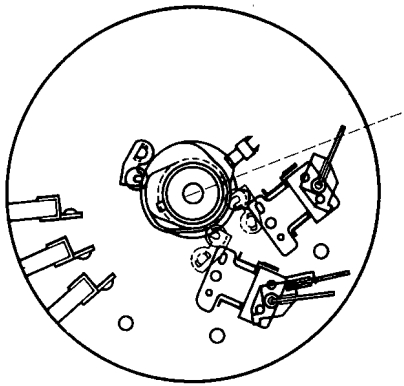
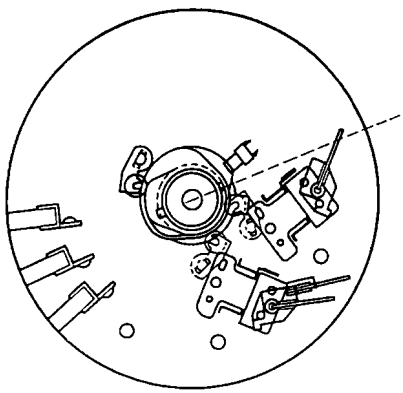
| | |
|---|---|
| Transfer drum sheet cleaning  | The push-on brush is on; the retention brush and transfer brush are off. |
| Oil removing/cleaning  | The push-on brush is on; the transfer brush and retention brush are off. |

**Figure 3-637**

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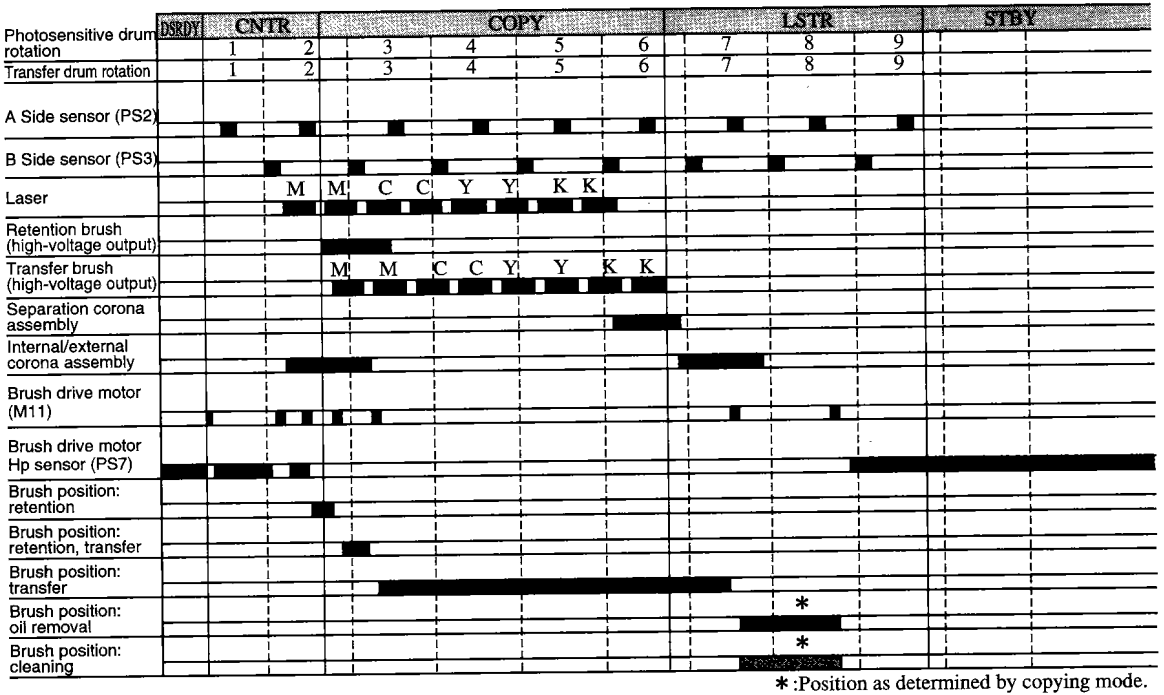


*:Position as determined by copying mode.

**Figure 3-638 Brush Position A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1**

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## 3. Separation Control

The copier executes separation, for both side A and side B, by its separation claw and separation push-up roller. See Table 3-640 for how separation is executed.

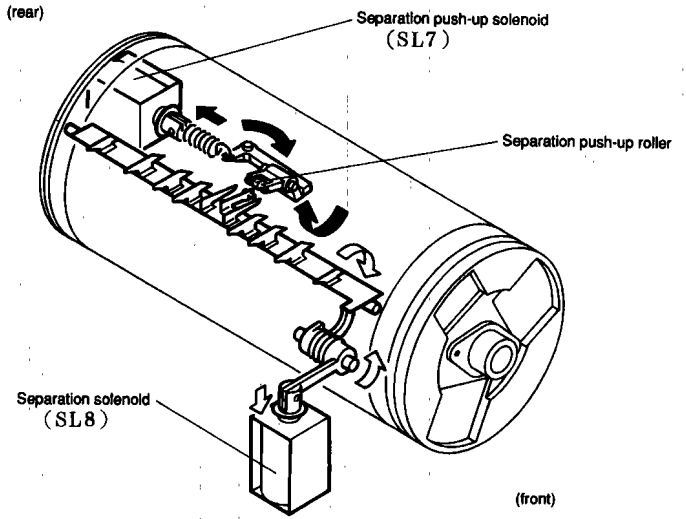


**Figure 3-639**


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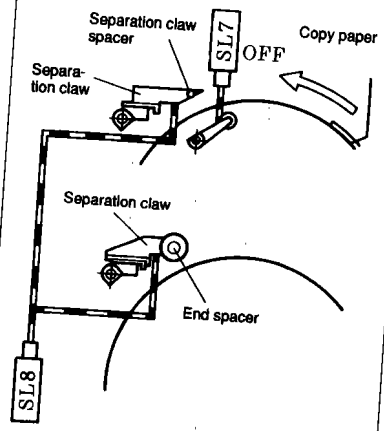
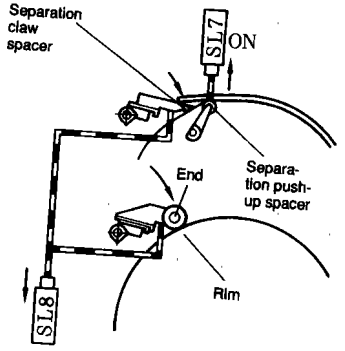
| | | |
|---|---|---|
| 1 |  | The diagram shows the condition immediately after transfer to copy paper.<br>The separation claw solenoid (SL8) and separation push-up solenoid (SL7) are off. |
| 2 |  | The separation solenoid (SL8) and separation push-up solenoid (SL7) turn on, thereby putting the separation spacer in contact with the transfer drum sheet. The separation claw is away from the transfer drum sheet for a distance equal to the thickness of the separation claw.<br>By the work of SL7, the separation push-up roller pushes up the transfer drum sheet from inside to deform a portion of the transfer drum sheet, thereby increasing the curvature.<br>Thereafter, the body of the copy paper serves to move its leading edge away from the transfer drum sheet, at which time the separation claw moves in to trigger separation. |

**Figure 3-640**

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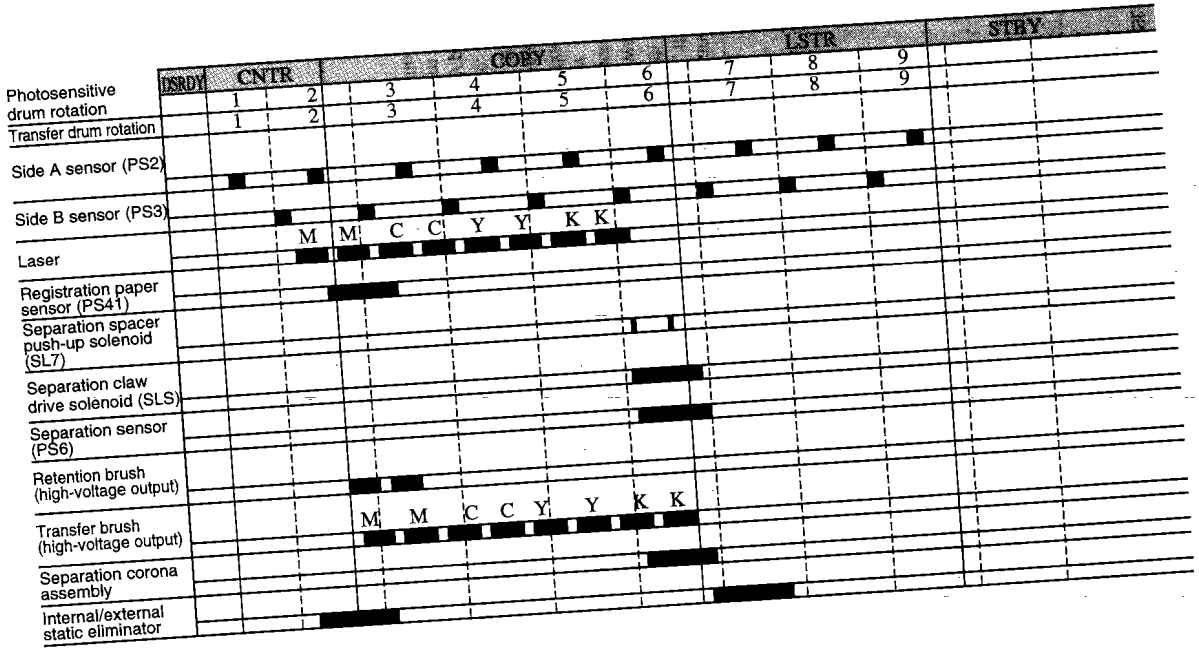


**Figure 3-641 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette1 Potential Control**



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## 4. Cleaning the Transfer Drum Sheet

Since the transfer drum sheet keeps copy paper on it by means of static electricity, it is subject to adhesion of foreign matter. The presence of foreign matter on the transfer drum sheet is likely to soil the back of copy paper and cause faulty transfer or retention.

To avoid such problems, the transfer drum sheet is cleaned by the following methods:

1. cleaning by the external brush/push-on brush.
2. cleaning by the oil removing roller.
3. cleaning by the polishing roller.

These cleaning operations may be roughly classified as shown in Table 6-609.

| Type | Timing | Cleaner |
|---|---|---|
| Normal cleaning | Post rotation | External brush/internal brush (retention static elimination) |
| Duplexing cleaning | Post rotation after duplexing copying | External brush/internal brush + oil removing roller |
| Specific cleaning | Post rotation after making specific number of copies | Polishing roller |

**Table 6-609**

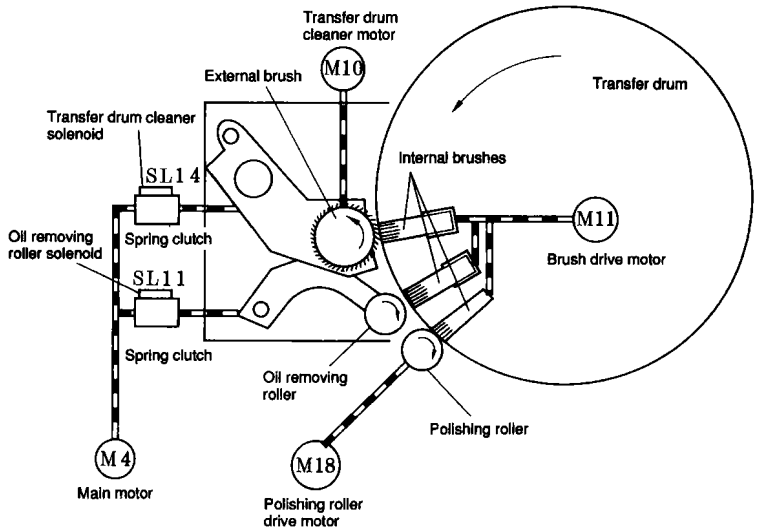


**Figure 3-642**

**a. External Brush**

The external brush is rotated at a high speed by the transfer cleaner motor (M10) in the opposite direction from the transfer drum sheet.

While the main motor (M4) is rotating, the transfer cleaner solenoid (SL14) turns on, causing the drive of the main motor to the cam through the spring clutch. The rotation of the cam in turn moves the transfer drum cleaner to butt against the transfer drum sheet.

The internal brush is butted against the transfer drum sheet by the work of the cam inside the transfer drum and by the drive of the brush drive motor (M11).

The transfer drum is cleaned during post rotation by the external brush.

The position of toner used for black toner density detection executed on the photosensitive drum corresponds to the position of the transfer drum connecting plate in relation to the transfer drum.

For this reason, the area in front and behind the transfer drum connecting plate is cleaned a single operation more than other areas of the transfer drum connecting plate.

The internal brush is released at the transfer drum connecting plate.

This consideration helps prevent the deformation of the internal brush which otherwise could be caused by interference between the transfer drum sheet fixing plate and internal brush.

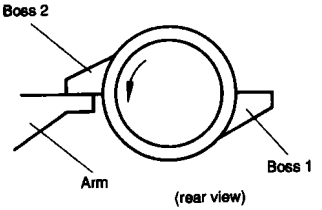


**Figure 3-643 Control Cam**

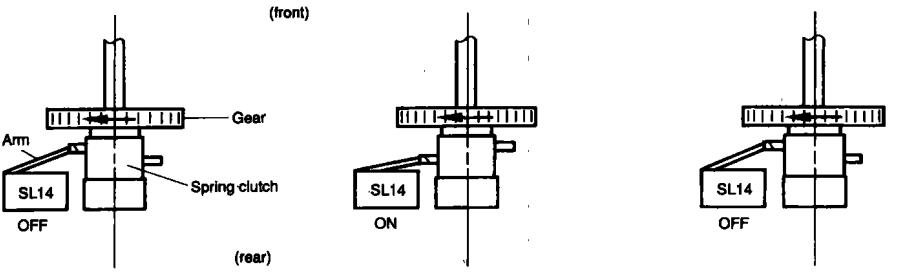


**Figure 3-644**

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## 5. Oil Removing Roller

In two-sided copy mode, copy paper whose first side has already been fixed is retained on the transfer sheet, causing the transfer sheet to come into contact with fixing oil. If post rotation was started as it is, the fixing oil would move from the transfer sheet to the photosensitive drum, causing the next copy to suffer from such detrimental effects as fogging. To prevent such a problem, the copier butts the oil removing roller against the transfer drum after copying on the second side to clean the transfer drum.

The oil removing roller is butted by turning on the oil removing roller solenoid (SL11) using the drive from the main motor. At this time, the internal brush for the roller is butted from inside the transfer drum, and the transfer drum cleaner motor (M10) is turned on to rotate the external brush as well, thereby enhancing the cleaning efficiency.

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## 6. Polishing Roller

### a. Outline

Over a period of time, the transfer sheet starts to collect paper lint, which leads to weakening of retention. To correct such deterioration, the copier is provided with a mechanism that polishes the surface of the transfer sheet for a specific number of copies, thereby recovering the force of retention.

When the polishing roller drive motor (M18) turns on, the polishing roller is engaged with the transfer sheet to start link rotation of the polishing roller, thereby polishing the transfer sheet.

### b. Operation

When the polishing roller drive motor (M18) turns on, the drive belt and the drive gear start to rotate, in turn rotating the spring clutch. The spring clutch is stopped after having made a half rotation by means of a stopper; since the motor (M18) keeps rotating, however, the polishing roller is butted against the transfer drum by the polishing roller engaging spring with the motor shaft as its fulcrum. The surface of the transfer drum sheet is polished in this condition.

The polishing roller is released and moved away from the transfer drum sheet by the work of the polishing roller returning spring.

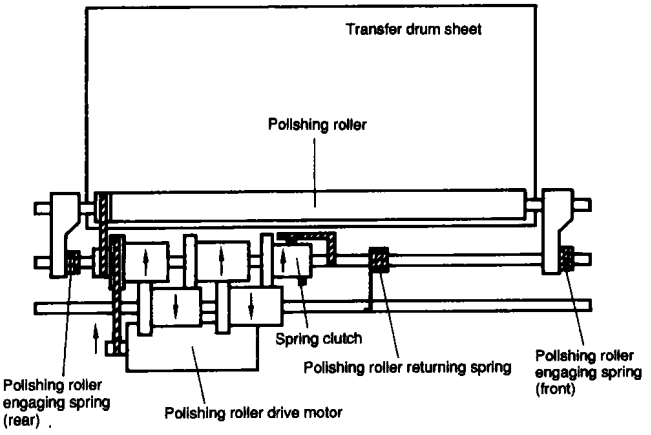


Figure 3-645


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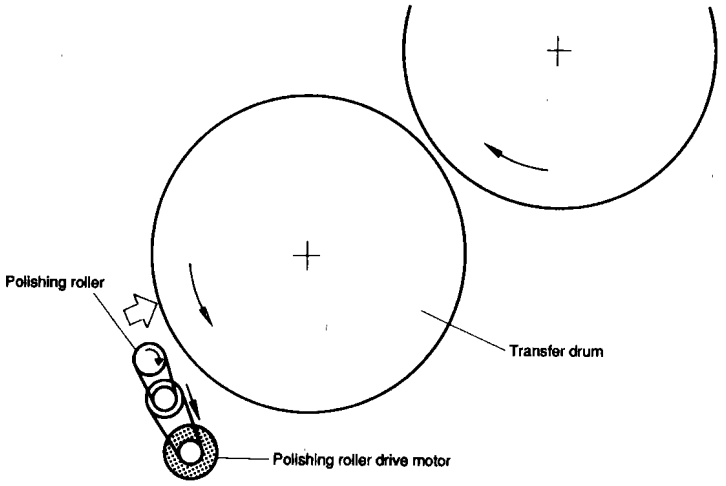


**Figure 3-646 Cross Section**

**c. Conditions and Period of Operation**

The polishing roller is operated under the following conditions and for the following time period:

| Conditions | Time |
|---|---|
| The temperature of the fixing roller is 110°C when the power switch is turned on and, in addition, the switch is turned on after making 1,000 copies. | As long as the transfer drum makes 50 rotations. (The transfer cleaner remains in contact for 52 rotations.) |
| During post rotation after 12,000 copies (cumulative while the copier remains powered) have been made. | |

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# F. Fixing/Delivery Assembly

## 1. Outline

The following loads are driven by the fixing motor (M5):

- Upper fixing roller
- Lower fixing roller
- Delivery roller
- Oil applying roller
- Fixing belt engagement
- Feeding belt

The cleaning belt is driven by the take-up solenoid (SL6).

To ensure proper fixing during two-sided copy or OHP copy mode, the copier controls the fixing speed in four different settings; this consideration also serves to make up for its path.

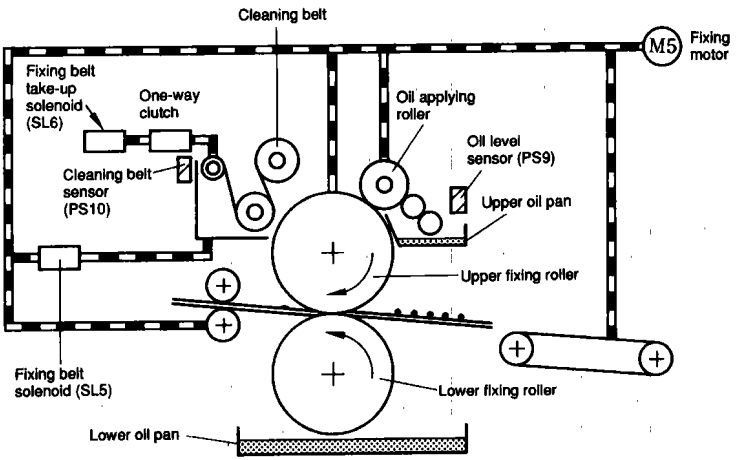


Figure 3-647

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## 2. Controlling the Fixing Roller Temperature

The upper fixing roller and lower fixing roller are each heated by a single fixing heater (H1, 600 W; H2, 600 W). The temperature of the upper fixing roller is monitored by a thermistor (THM1), and the temperature of the lower fixing roller is also monitored by a thermistor (THM2).

Fixing roller temperature is 'high'
→ Thermistor resistance is too 'low'
→ Voltage of fixing roller surface temperature detection signal (THM1, THM2) is 'low'

Based on the voltage, the microprocessor on the DC controller causes the upper fixing heater drive signal (UHON) and lower fixing heater drive signal (LHON) to go either '1' or '0' so as to keep the surface temperature of the upper roller and lower roller at a specific level.

Upper roller
full color copying .....controlled to 173°C (173°C)
mono color coping ....controlled to 185°C (185°C)
in STBY .....controlled to 170°C (170°C)

Lower roller
full color copying .....controlled to 171°C (162°C)
mono color coping ....controlled to 183°C (174°C)
in STBY .....controlled to 170°C (161°C)

(The value in parentheses indicates the temperature of the thermistor.)

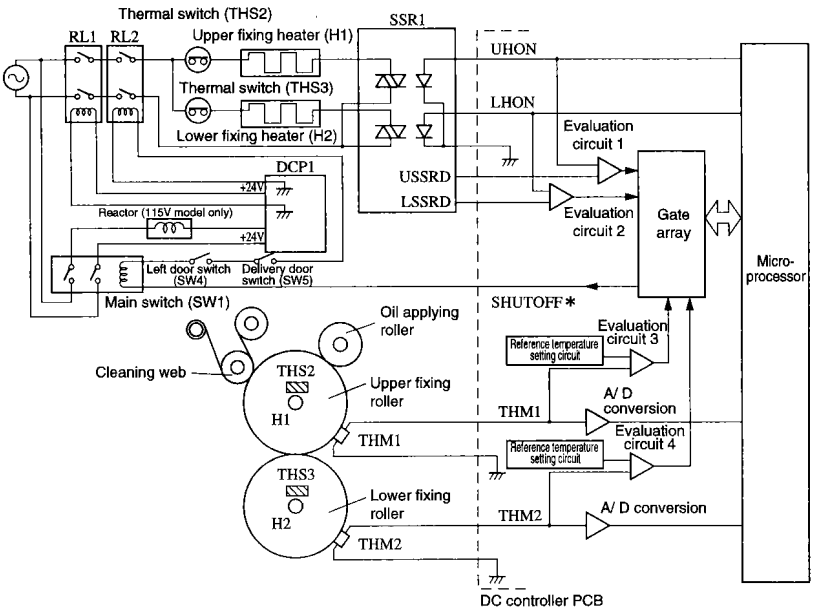


**Figure 3-648**

## 3. Protection Mechanism

The copier is equipped with the following four protection mechanisms to prevent problems in the fixing heater:

- The microprocessor monitors the voltage of thermistors THM1 and THM2; in response to an error, the copier indicates 'E000'.
- The gate array monitors the state of the SSR and heater drive signal; if the SSR is on in the absence of the heater drive signal from the microprocessor (USSRD, or LSSRD=1), it generates the SHUTOFF* signal to turn off RL2, thereby cutting power to the fixing heater.
- The gate array monitors the state of the SSR and heater drive signal; if the SSR is off in the presence of the heater drive signal (USSRD or LSSRD=0), an open circuit is identified in the heater circuit, and the copier indicates 'E000'.
- If the temperature inside the thermal switch for the upper roller exceeds 230°C, or if the temperature inside the thermal switch for the lower roller exceeds 230°C, the thermal switch turns off to cut out the power to the fixing heater.

**Reference:**

Once its contact opens, the thermal switch (THS2, THS3) cannot be used again; the contact will not recover even if the temperature lowers from error to normal.

Resetting for E000

1) Remove the cause.
2) Activate service mode, and select 'FUSER' under 'FUNC'.
3) Select 'E000-RLS', and set it to 'E000-RLS=1'.
4) Turn off and on the power switch.

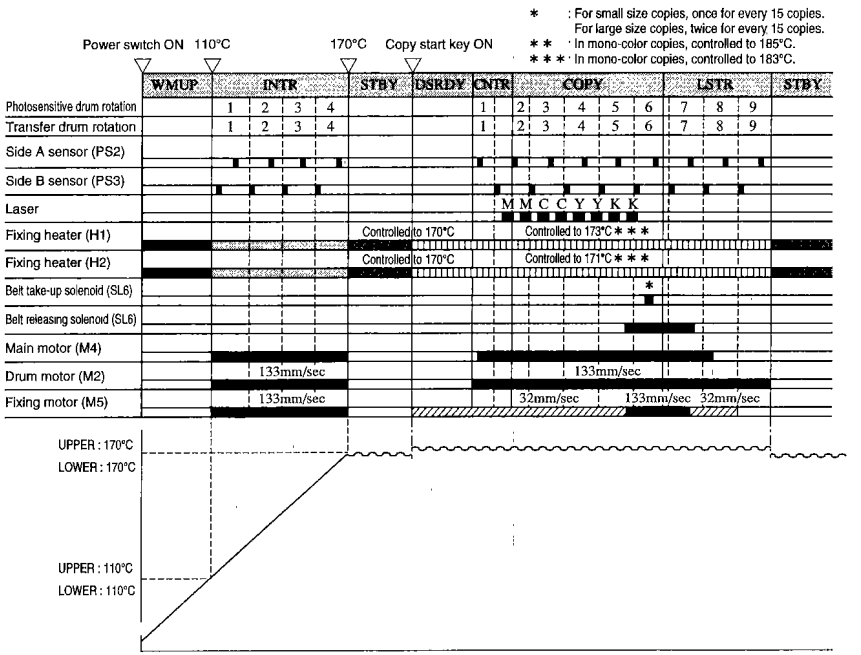


**Figure 3-648 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Plain**


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## 3. Driving the Cleaning Belt

The belt used to clean the upper fixing drive is engaged with the upper fixing roller when the fixing belt releasing solenoid (SL5) turns on and off in response to the belt drive signal (SL5D*; '0', '1') generated by the DC controller.

The belt is taken up 0.45 mm each time the fixing belt take-up solenoid (SL6) turns on and off. (The clearing belt itself becomes released when it is taken up.)

The fixing belt take-up solenoid turns on and off so many times as determined by the length of copy paper used.

| Copy paper | Number of cleaning belt solenoid operations |
|---|---|
| Small size (182 to 216 mm) | Once for every 8 copies |
| Large size (217 to 432 mm) | Once for every 4 copies |

**Table 3-610**

**Note:**
For transparencies, the solenoid turns on once for every 2 copies.

The edge of the belt is provided with a cut-out.

When the belt has been taken up to the point of the cut-out, the arm that has been supported by the belt drops and is detected by the belt length sensor (PS10).

When the sensor detects the arm, the copier indicates a message on its control panel.

**Reference:**

1. 'E005' appears when the cleaning belt solenoid has turned on and off about 270 times after the message has been indicated.
2. The belt is 5 m in length, and the cut-off is located at a point 4.7 m from the first end of the belt.
3. You must execute 'E005-RLS' of 'FUSER' under 'FUNC' in service mode and turn off then on the power switch whenever you have replaced the cleaning belt.

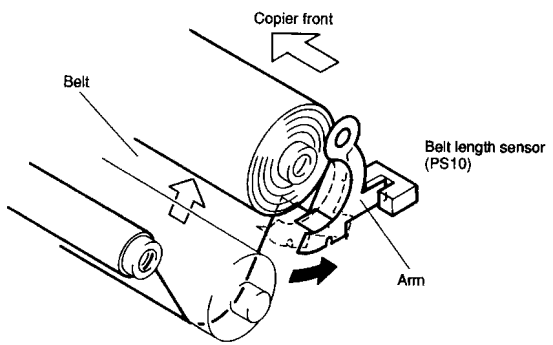


**Figure 3-649**

## 4. Fixing Oil Applying Mechanism

As shown in Figure 3-650, the copier uses a circulating mechanism for fixing oil.

The oil applying roller remains in contact with the upper fixing roller at all times to prevent offset by supplying the roller with fixing oil.

The work of the oil pump solenoid (SL12) draws oil from the oil bottle into the upper oil pan.

The level of the silicone oil in the upper oil pan is monitored by the oil level sensor (PS9) through detection of the position of the arm of the float floating in the upper oil pan.

If PS9 does not detect the arm at power-on, SL12 repeats turning on and off until PS9 detects it.

If PS9 does not detect the arm after operating SL12 for 10 min, the copier identifies the absence of oil, and indicates a message.

Then, 'E008' is indicated if PS9 does not detect the arm after making 100 copies.

The oil applying felt inside the oil pump solenoid serves as a filter for the circulating silicone oil.

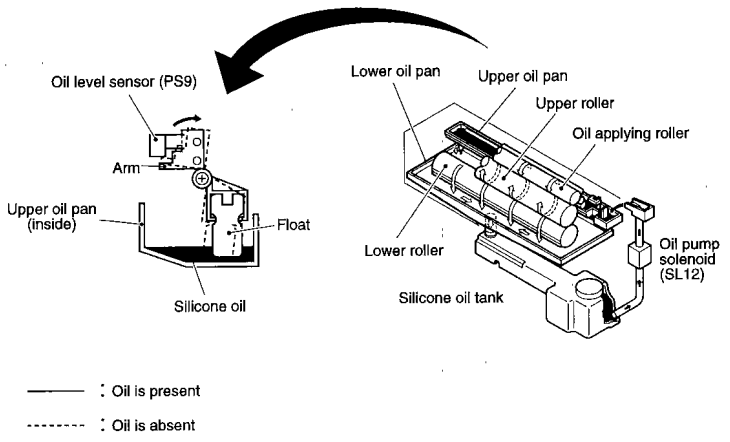


**Figure 3-650**

**Reference:**

To clear 'E008',

1) Pour fixing oil into the oil case.
2) Turn off and then off the power switch.
   - The oil supply mechanism is activated automatically with 'E008' still displayed; this operation ends in about 5 min.
3) Turn off and then on the power switch.

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## 5. Controlling the Fixing Speed

The path in the copier's feeding assembly between the transfer drum and the fixing assembly is shorter than the path of conventional copiers; to accommodate the shorter path and to ensure proper fixing in two-sided copy mode or OHP copy mode, the copier controls the fixing speed in four settings.

- Normal mode (plain paper fixing) ..... 133 mm/sec
- 2nd side of two-sided copy (plain paper)/special paper 1 ..... 121 mm/sec*
- Thick paper (105 to 157g) mode ..... 80 mm/sec
- OHP mode ..... 80 mm/sec
- Pick-up/retention transfer (all paper types) mode/ special paper 2 ..... 32 mm/sec

* Both 1st and 2nd faces

The fixing motor starts to rotate when the drive signal (M5ON*) goes '0'; the speed is varied based on the combination of speed switching signals (M5SPD0 and M5SPD1). If the rotation speed of the fixing motor deviates for some reason, the motor ready signal (M5RDY*) goes '1; in response, the DC controller indicates 'E014' on the control panel.

| M5SPD0 | M5SPD1 | Fixing speed |
|---|---|---|
| 0 | 0 | 133mm/sec |
| 0 | 1 | 121mm/sec |
| 1 | 0 | 80mm/sec |
| 1 | 1 | 32mm/sec |

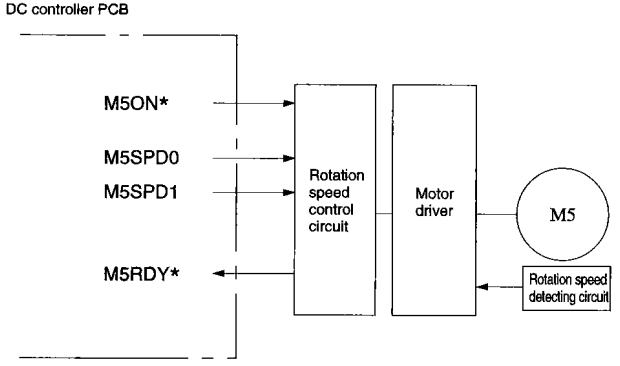


**Figure 3-651**

**Reference:**

During copying, the fixing web is engaged while in OHP mode and special paper 2 mode; it is disengaged in other modes.

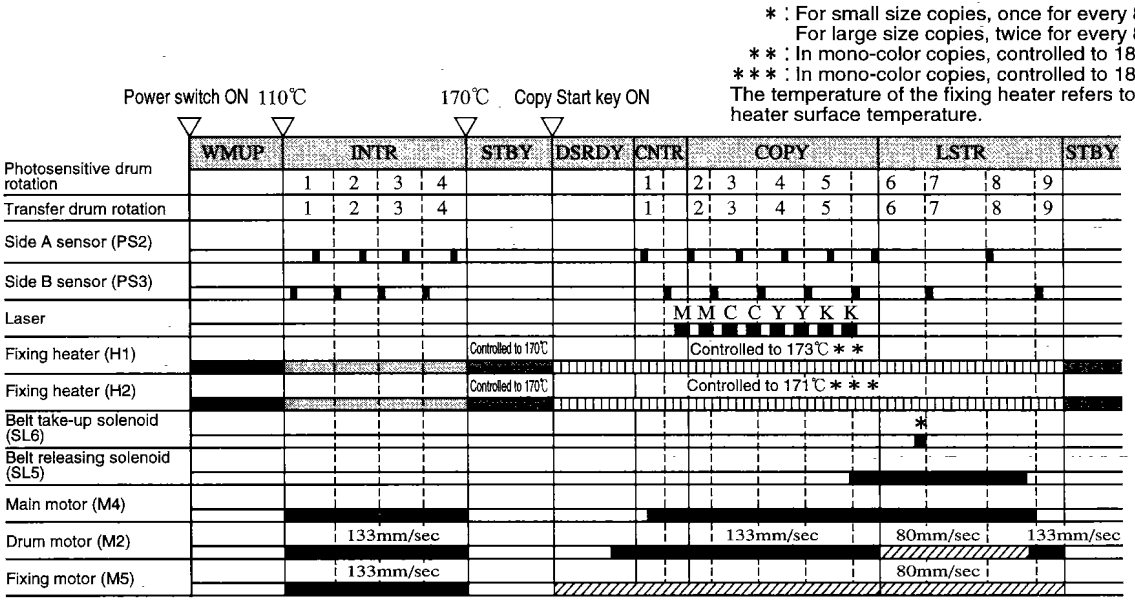


**Figure 3-652 A4, LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, OHP**



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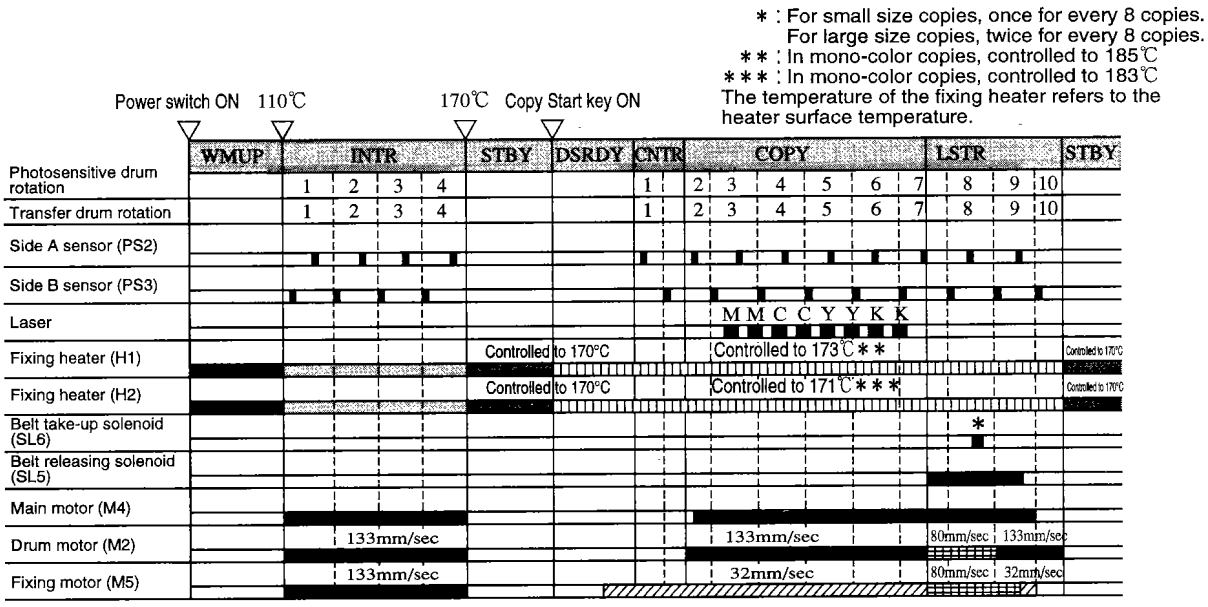


**Figure 3-653 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Thick Paper**

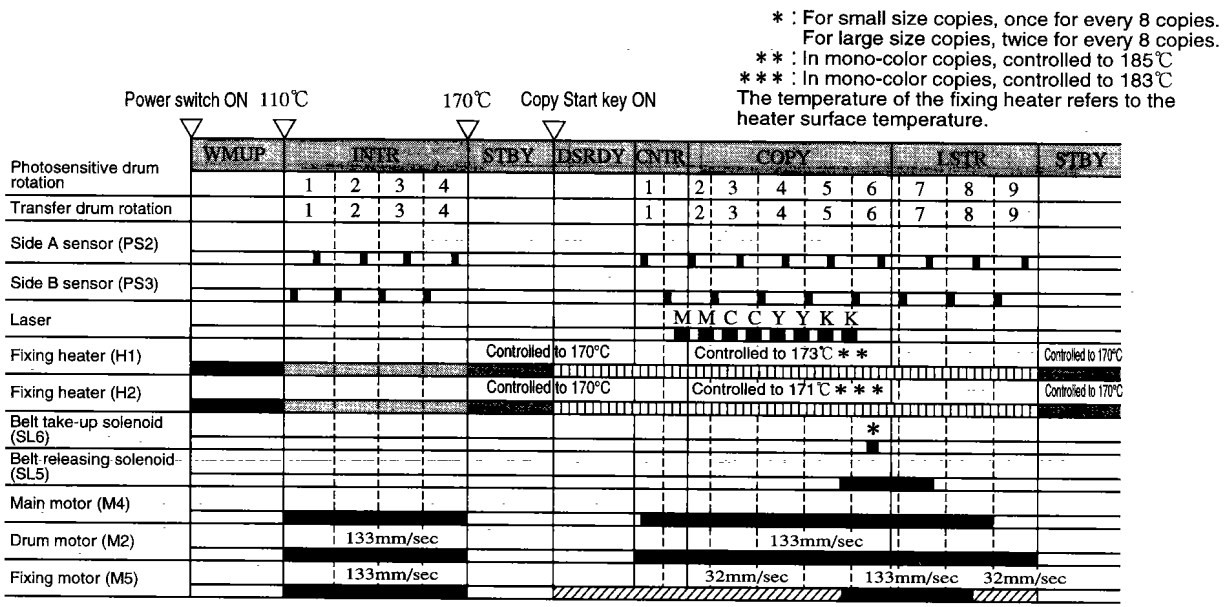


**Figure 3-654 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Plain**



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## G. Detecting Jams

The copier is equipped with the following sensors to check the presence/absence of copy paper and to make sure that paper is moving properly:

Multifeeder pick-up sensor (PS8)
Pick-up vertical path 1 sensor (PS19/PS26*)
Pick-up vertical path 2 sensor (PS24)*
Pick-up vertical path 3 sensor (PS25)*
OHP sensor (PS40)
Registration paper sensor (PS41)
Pre-photosensitive drum cleaner paper sensor (PS43)
Pre-transfer sensor (PS4)
Post-transfer sensor (PS5)
Separation sensor (PS6)
Delivery inside sensor (PS11)
Delivery outside sensor (PS27)
Delivery vertical path 1 sensor (PS28)*
Duplexing pre-reversal paper sensor (PS29)*
Duplexing post-reversal paper sensor (PS30)*
Duplexing reversing assembly outlet paper sensor (PS31)*
Duplexing stacking assembly paper sensor (PS32)*
Duplexing feeding assembly paper sensor (PS33)*
Delivery vertical path 2 sensor (PS39)*

** For CLC800 only.*

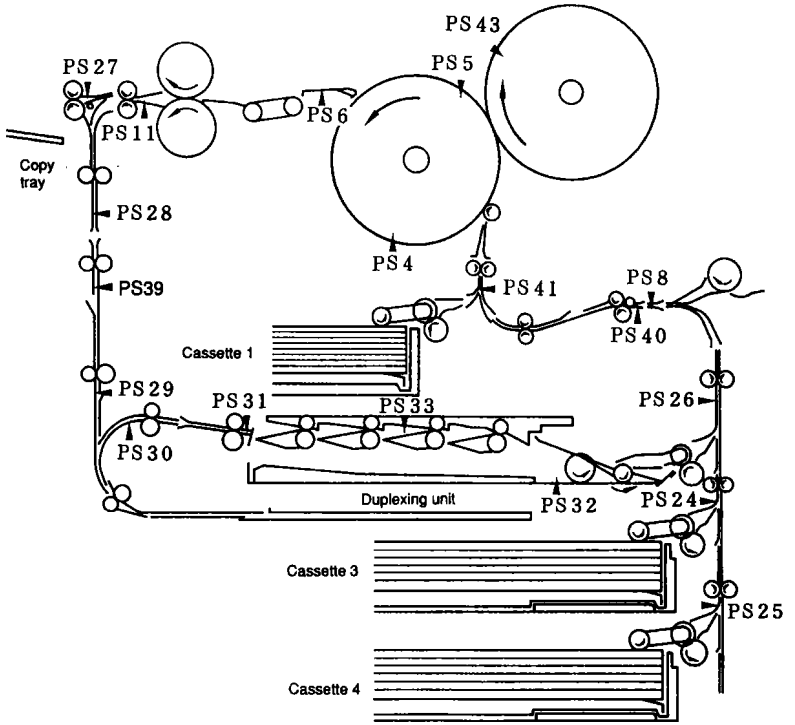


**Figure 3-655 (CLC800)**

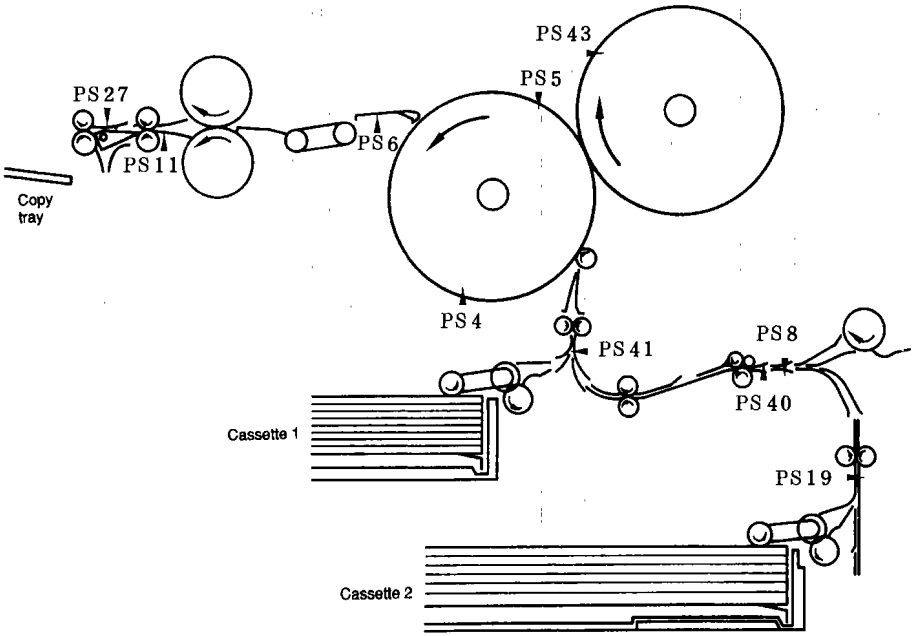


**Figure 3-656 (CLC700)**

The presence or absence of copy paper and jams is checked with reference to whether there is paper over the respective sensors at such times as stored in the microprocessor in advance.

The copier has a mechanism which retains data on how many copies remain to be made and the copy mode effective at time of jams; therefore, you need not reset the copy mode or the copy count after having opened its door for jam removal.

The copier also identifies a jam if its OHP sensor (PS40), separation sensor (PS6), or delivery sensor (PS11, PS27) detects the presence of copy paper at time of power-on.

Likewise, the copier identifies a jam if either pre-transfer paper sensor (PS4) or post transfer sensor (PS5) detects the presence of paper at time of power-on. A check is made once again at the home position of the transfer drum after the drum has made a single rotation; if any of the sensors detects the presence of paper, the copier identifies a jam.

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The pre-photosensitive cleaner paper sensor (PS43) is a reflecting-type paper sensor and serves to prevent copy paper from sliding into the photosensitive drum cleaner by monitoring the photosensitive drum for the presence of paper; the sensor is effective only in TYPE 2 machines*.

The new type of DC controller PCB may be used for TYPE 1 CLC700/800*; however, it does not issue an error or jam indication if the sensor is faulty or if the connector is not connected.

*See the cover of Chapter 3.

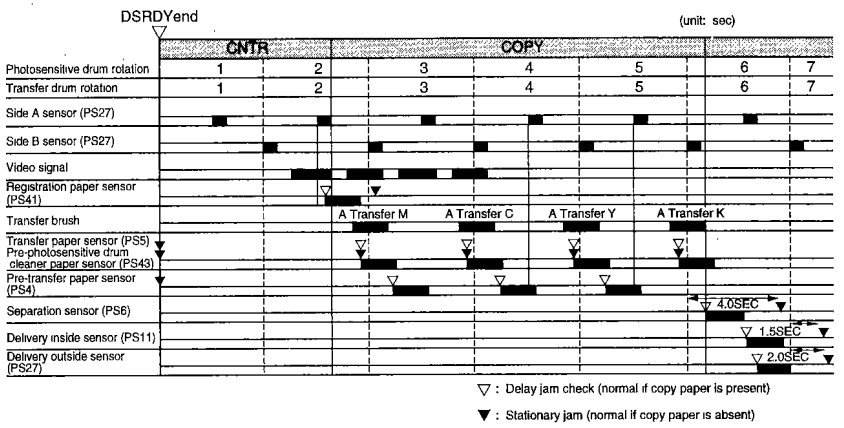


**Figure 3-657 A4/LTR, 2 Copies, 4-Color, DIRECT, Cassette 1, Potential Control**

# VII. CONTROL PANEL

## A. Outline

The copier's control panel consists of the control panel relay PCB, 200x640-dot liquid crystal panel, keypad PCB (including the pilot lamp), and subkey PCB, and it has the following functions:

① Data communication
② LCD processing
③ LCD contrast adjustment
④ Touch switch input

## B. Operation

### 1. Data Communication

The microprocessor (CPU) on the reader controller PCB is used to control data communications.

### 2. LCD Processing

The microprocessor on the reader controller PCB sends commands to the LCD controller as necessary according to the stored program, and the LCD controller interprets these commands for execution. The LCD controller is also used to turn on and off the indications in response to commands from the program.

In addition, the LCD controller writes display character codes into the display memory RAM in sequence; the data in the display memory RAM is indicated on the display panel in response to the timing signal generated by the LCD controller.

### 3. Adjusting the LCD Contrast

VR5301 is found on the control panel relay PCB and may be used to adjust the contrast of the display panel.

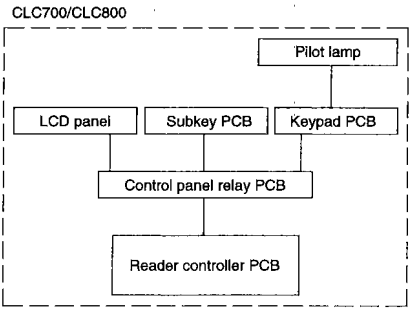


**Figure 3-701**


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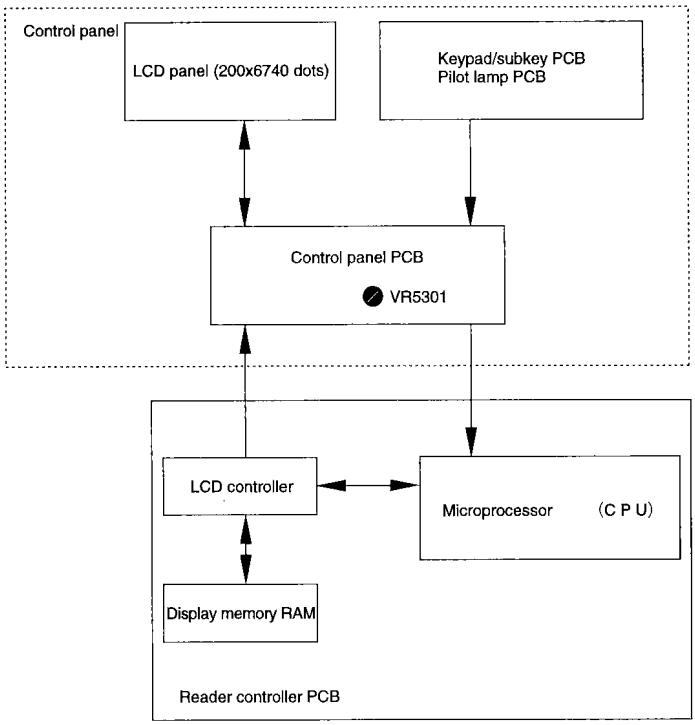


**Figure 3-702**

## 4. Touch Switch Input

The keys on the touch switch panel and the controller PCB on the control panel are connected as shown in Figure 3-703. The touch switch panel consists of two glass sheets coated with transparent conducting membranes with spacers in between, and is formed in a specific pattern of keys (12 columns × 20 rows).

When the face glass plate is pressed by a finger, the two glass sheets come into contact to provide electrical continuity.

In response, a pair of electrodes will let electricity pass, enabling detection of XY coordinates just like a conventional key matrix; in other words, the correspondence between the key scan signal from the control panel controller circuit and the input signal to the control panel controller circuit helps the control panel controller PCB to identify which key has been pressed.

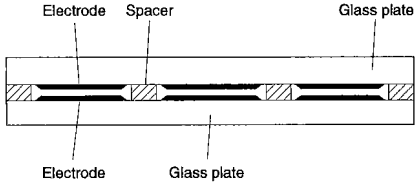


**Figure 3-703**

# VIII. EDITOR

## A. Outline

The copier's editor is of a static type, and consists of two tablets and a pen switch; one tablet each is dedicated to reading in horizontal (X) direction and to reading in vertical (Y) direction.

The controller PCB reads points pressed by the pen switch as settings of the area selected by the user.

The copier's tablet has electrode wires at intervals of 6 mm; the contact between these electrode wires and the pen switch by means of static electricity enables identification of points pressed by the pen switch.

## B. Operation

When the pen switch presses the tablet, the CPU on the control PCB resorts to the decoder of the appropriate tablet, and applies pulses (1, 2, ..., n, n+1) to the appropriate electrode wires in sequence.

These pulses and the pen switch trigger a static contact, sending voltage fluctuations through the pen switch to the controller PCB. (See Figure 3-801.)

The level of voltage that have been read is converted to digital signals by the A/D converting circuit of the controller PCB; the CPU then makes computations by way of converting them into areas in units of mm, and sends the results to the copier.

**Reference:**

Since the points of input are computed based on static contacts, a thick original (4 mm max.) may be placed on the editor. However, you may not use conductive materials, or pressure-sensitive paper or carbon-backed paper.


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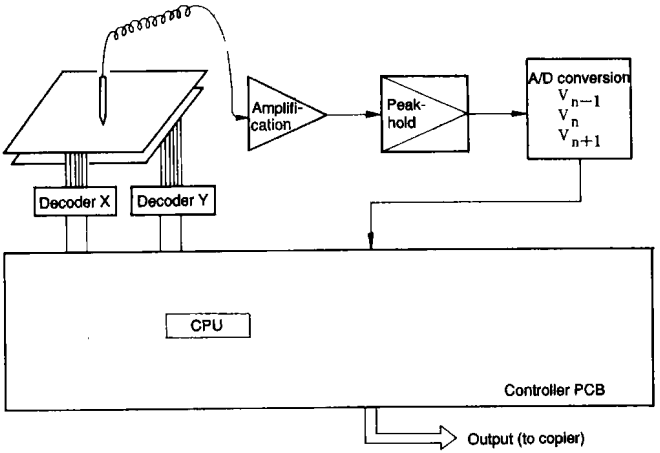
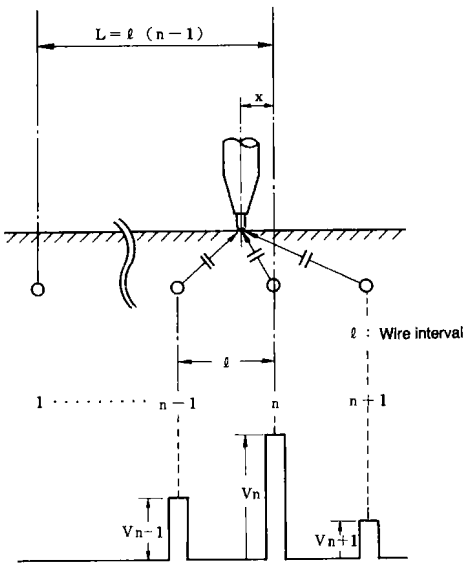



Figure 3-801




**Reference:**

Pulses are applied to the electrode wires in sequence (1, ..., n–1, n, n+1).

⇩

At nth electrode wire, the maximum value Vn
∴ L : ℓ (n–1)
ℓ : wire interval

⇩

Obtains
$\frac{Vn-(Vn-1)}{Vn-(Vn+1)} = S$
then, computes x from the data table.

⇩

Obtains
⊕ when between n+1
⊖ when between n–1

Figure 3-802

## C. Zero-Adjustment of the Input Coordinates

You must set the DIP switch on the controller PCB according to the label attached to the cable of the tablet (Figure 3-803, -804) whenever you have replaced the tablet or the control PCB inside the editor.

Execute 'EDADJ-X, -Y' in service mode if you note any discrepancy in the input coordinates after having made the settings.

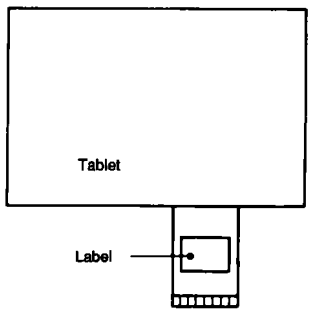



**Figure 3-803**

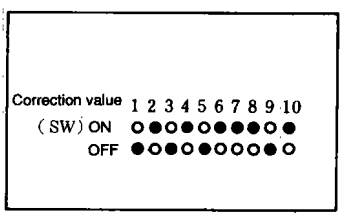



**Figure 3-804 Display Sample (●: setting)**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# IX. FANS

The copier is equipped with 14 fans to discharge ozone, draw stray toner, and cool the machine.

Figure 3-901 shows the locations of these fans; Table 3-901 shows the function, filters used, and orientation of each fan. Figure 3-902 shows when each of the fans turns on.

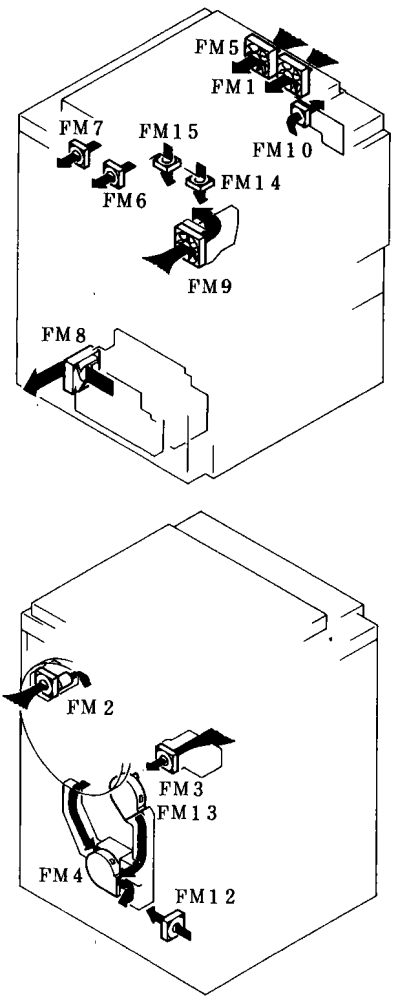


**Figure 3-901**


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| Notation | Name | Orientation | Filter | Function |
|---|---|---|---|---|
| FM1 | Scanner system cooling fan1 | Blow | Air | Prevents overheating of the CCD and copyboard glass by the scanning lamp. |
| FM2 | Primary corona assembly fan (big, small) | Blow | Air | Blows air against the primary corona assembly to prevent collection of toner. |
| FM3 | Fixing assembly heat exhaust fan | Suction | Ozone | Discharges heated air from around the fixing assembly to the outside of the machine. |
| FM4 | Ozone exhaust fan 1 | Suction | Ozone Air | Draws toner and ozone from the developing assembly duct and discharges it to the outside of the machine. |
| FM5 | Scanning system cooling fan 2 | Blow | Air | Prevents overheating of the CCD and copyboard glass by the scanning lamp. |
| FM6 | Scanning system cooling fan 3 | Suction | None | Prevents overheating of the CCD and copyboard glass by the scanning lamp. |
| FM7 | Scanning system cooling fan 4 | Suction | None | Prevents overheating of the CCD and copyboard glass by the scanning lamp. |
| FM8 | Power supply cooling fan | Suction | None | Prevents overheating of the DC power supply 1. |
| FM9 | IP cooling fan | Blow | None | Prevents overheating of the IP PCB. |
| FM10 | Electrical equipment cooing fan 1 | Blow | None | Cools the electrical equipment. |
| FM12 | Developing bias power supply PCB cooling fan | Blow | None | Blows air against the developing bias power supply PCB to prevent overheating. |
| FM13 | Ozone exhaust fan 2 | Suction | Ozone Air | Draws toner and ozone from the developing assembly duct and discharges it to the outside of the machine. |
| FM14 | Feeding fan 1 | Blow | None | Keeps paper separated from the transfer drum (particularly curled paper) against the feeding belt to ensure proper feeding. |
| FM15 | Feeding fan 2 | Blow | None | Keeps paper separated from the transfer drum (particularly curled paper) against the feeding belt to ensure proper feeding. |

**Table 3-901**

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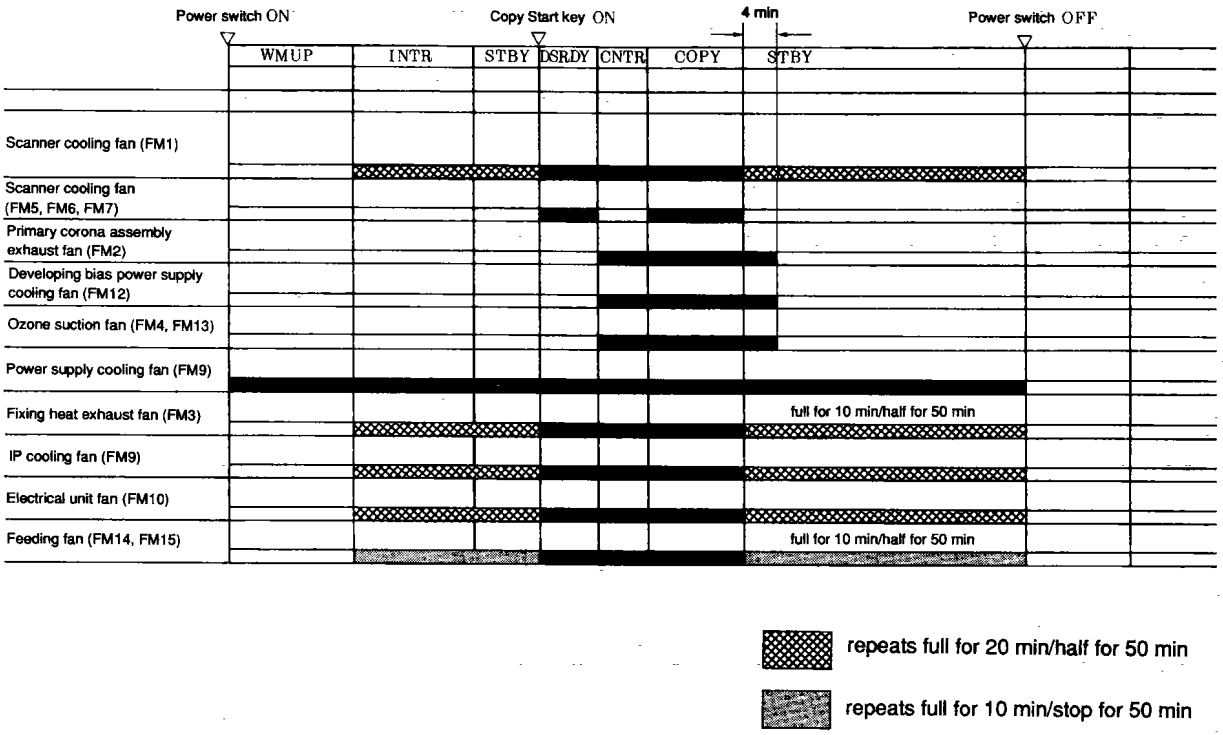
Power switch ON
Copy Start key ON
4 min
Power switch OFF
WMUP
INTR
STBY
DSRDY
CNTR
COPY
STBY
Scanner cooling fan (FM1)
Scanner cooling fan (FM5, FM6, FM7)
Primary corona assembly exhaust fan (FM2)
Developing bias power supply cooling fan (FM12)
Ozone suction fan (FM4, FM13)
Power supply cooling fan (FM9)
Fixing heat exhaust fan (FM3)
full for 10 min/half for 50 min
IP cooling fan (FM9)
Electrical unit fan (FM10)
Feeding fan (FM14, FM15)
full for 10 min/half for 50 min
repeats full for 20 min/half for 50 min
repeats full for 10 min/stop for 50 min

**Figure 3-902**



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# X. POWER SUPPLY

## A. Power Supply

Figures 3-1001 and -1002 show the distribution of power among the copier's power supplies.

The AC power supplied to the main power supply is turned on and off by the main switch (SW1).

When AC power is supplied to the power supply PCB (DCP1), the PCB generates +27 V, +24 V, +24 Vf, +15 V, +8 V (two channels, for loads and for analog), +5V, and –8 V.

The energy saving switch (SW10) serves to keep the cassette heaters and the like on at all times by the setting of the switch; see Figure 3-113.

Table 3-1001 shows the cassette heaters and others that are turned on by the energy saving switch and main switch.

Since turning off the main switch cuts off DC power to the DC controller circuit and reader unit controller circuit, the copier is equipped with a lithium battery for backing up the RAMs on the PCBs.

## B. Protection Mechanisms of the Power Supply Circuit

The main power supply PCB and options PCB are equipped with an overcurrent detecting circuit, which triggers protective mechanisms to cut out the output should a short circuit occur for some reason.

To reset the machine in response to the activation of the protection mechanism, turn off the power switch, disconnect the power plug, remove the cause of activation, and switch the power again; the protection circuit may be reset by keeping the AC power supply of the main power supply PCB off for about 30 sec and turning on the AC power again.

| Power saving switch (SW10) | Main switch (SW1) | Drum heater (H4) | Duplexing stacking assembly heater (H3) | Upper cassette/ Lower cassette heater (H5, H6) |
|---|---|---|---|---|
| Normal position (right) | ON | ON | ON | ON |
| Normal position (right) | OFF | ON | OFF | ON |
| Power saving position (left) | ON | ON | ON | ON |
| Power saving position (left) | OFF | OFF | OFF | OFF |

**Note:** At time of shipment, the power saving switch is set to normal position (right).

**Table 3-1001**

⚠ **CAUTION:**
Replace the lithium battery only with the one listed in the Parts Catalog. Use of a different battery may present a risk of fire or explosion. The battery may present a fire on chemical burn hazard if mistrated. Do not recharge, disassemble or dispose of it in fire.
Keep the battery out of reach of children and discard any used battery promptly.

**Note:**
If both upper and lower fixing heaters are on, the drum heater off signal is sent by the DC controller PCB to SSR2, thereby cutting off the power output to the drum heater and cassette heater.

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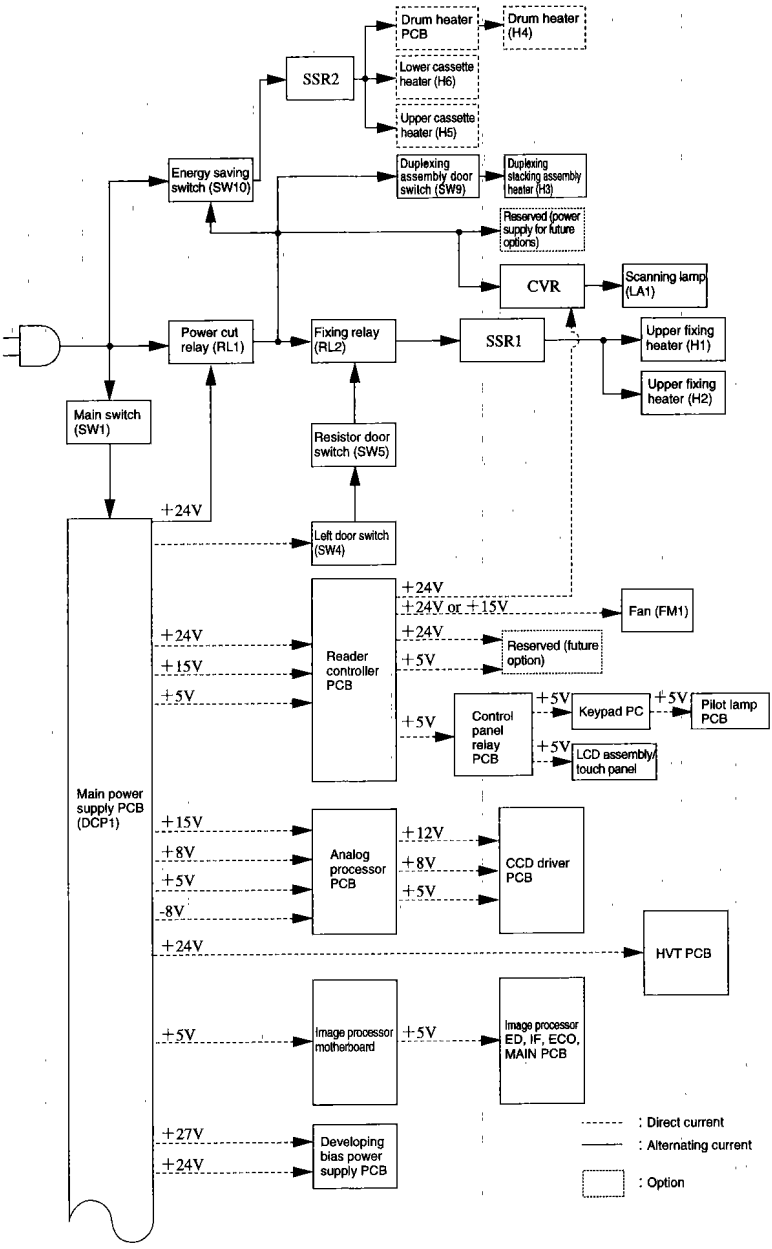


**Figure 3-1001**


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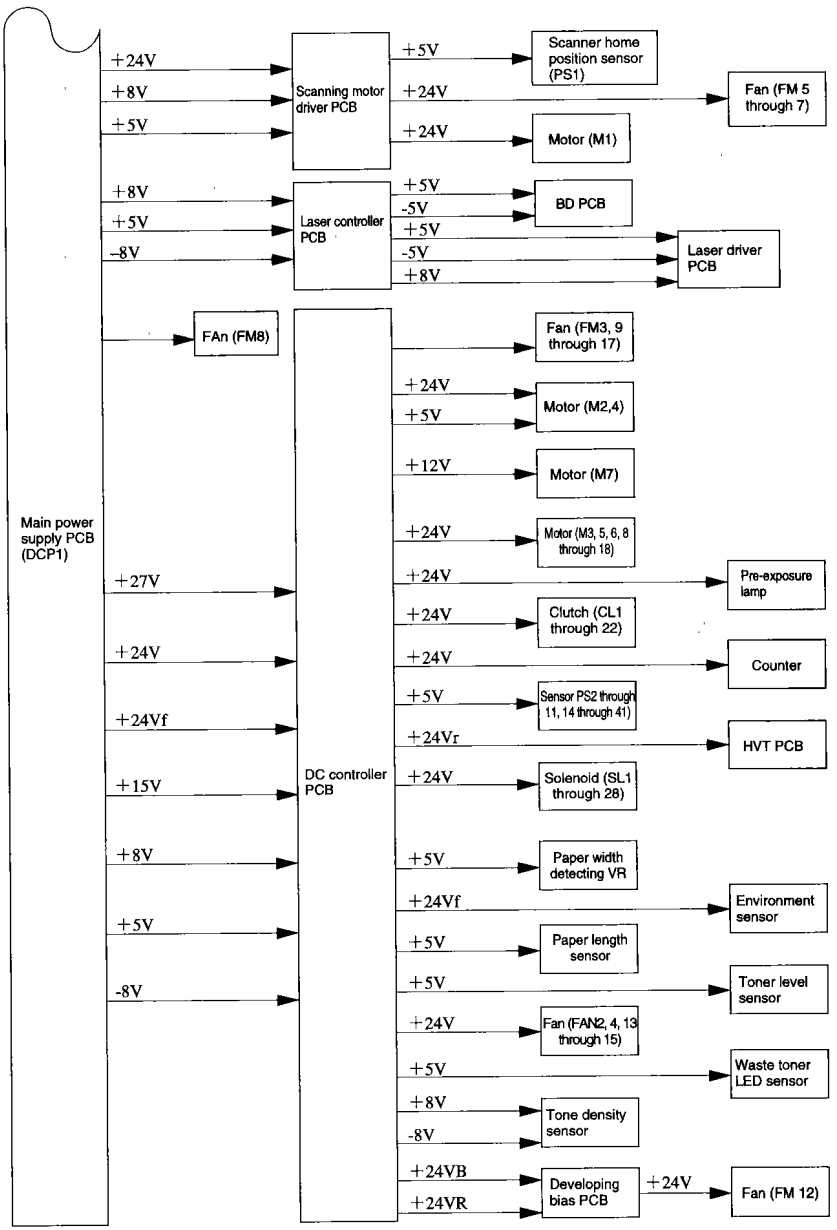


**Figure 3-1002**

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# XI. SERVICE MODE

## A. Outline

The copier's service mode can be classified into the six modes shown in Table 3-1101.

| No. | Notation | Description |
|---|---|---|
| 1 | DISPLAY | Control display mode |
| 2 | ADJUST | Adjustment mode |
| 3 | FUNC | Function mode |
| 4 | OPTION | Settings mode |
| 5 | TEST | Test print mode |
| 6 | COUNTER | Counter mode |

**Table 3-1101**

### 1. Activating Service Mode and Making Selections

- You cannot activate service mode while the copier is making copies.

1) Press the * key on the control panel.
2) Press the 2 and 8 keys on the keypad at the same time.
3) Press the * key.
   - The screen shown in Figure 3-1101 appears.
4) Select an item on the touch panel.
   - The appropriate screen appears.

### 2. Deactivating Service Mode

Press the Reset key.

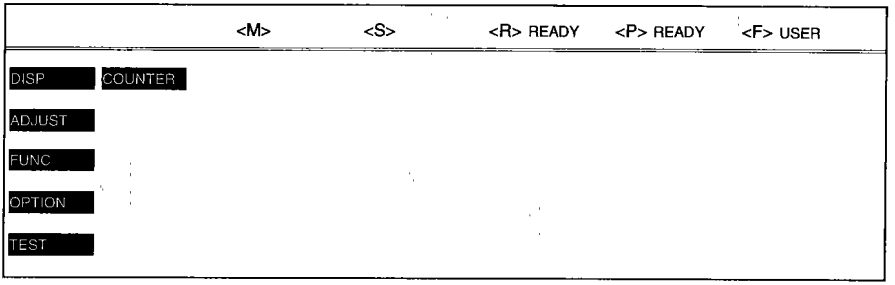


**Figure 3-1101**


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## 3. RAM Backup

Figure 3-1102 depicts the label attached behind the reader controller cover and the DC controller cover.

Each machine is adjusted at the factory and the value is recorded on the label.

You must go through the following whenever you have replaced the reader controller PCB or the DC controller PCB or if you have replaced any ROMs on the PCBs or cleared the RAMs:

### a After Replacing the DC Controller PCB

1) Replace the developer (for 4 colors), and execute 'STIR-4' and 'INIT-4' in service mode (FUNC→INSTALL).
2) Record the result (indicated by * in Figure 3-1102 (a)) on the service label; however, for "SGNL-K', record a value obtained by adding '37' to the result.
3) Enter the value recorded on the service label in service mode (FUNC→DC-CON; those not indicated by * in Figure 3-1102 (a)); however, for 'SGNL-K', re-enter the value you have recorded on the label.
4) When you have finished entering all values for each screen, press 'SEND'.
5) Set 'PASCAL' to '1' in service mode (ADJUST→PASCAL).
6) When you have entered all values, turn off and then on the power switch.

### b After Clearing the RAM on the DC Controller PCB

1) Enter the value recorded on the service label in service mode (FUNC→DC-CON).
2) When you have entered all values on each screen, press 'SEND'.
3) Set 'PASCAL' to '1' in service mode (ADJUST→PASCAL).
4) When you have entered all values, turn off and then on the power switch.

### c After Replacing the ROM on the DC Controller PCB

1) Execute 'RAM-CLR' in service mode (FUNC→DC-CON).
2) Go through the steps given under "After Clearing RAM on the DC Controller PCB".

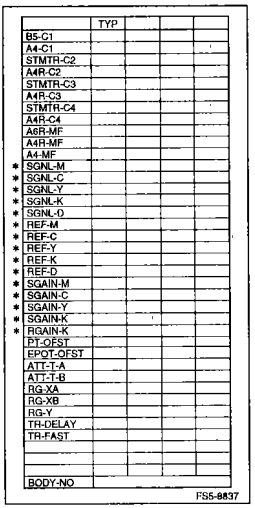


**Figure 3-1102 (a)**

**d After Clearing the RAM on the Reader Controller PCB**

1) Enter the value recorded on the service label in service mode (FUNC→R-CON; indicated by * in Figure 3-1102 (b)).
2) Execute 'FUNC→CCD→AUTO-ADJ' in service mode, and record the result on the service label (indicated by * in Figure 3-1102 (b)).
3) If a projector is installed, execute 'PROJ-CCD' in service mode (FUNC→PRJ-ADJ).
4) When you have entered all values, turn off and then on the power switch.

**e After Replacing the ROM on the Reader Controller PCB**

1) Execute 'RAM-CLR' in service mode (FUNC→R-CON).
2) Go through the steps under "After Replacing the Reader Controller PCB or Clearing the RAM".

| | TYP | | |
|---|---|---|---|
| CVR-TYPE | | | |
| ADJ-X | | | |
| ADJ-Y | | | |
| ADJ-S | | | |
| ED-ADJ-X | | | |
| ED-ADJ-Y | | | |
| ADJ-J | | | |
| EC-GLASS | | | |
| DA-XS | | | |
| DA-XE | | | |
| DA-YS | | | |
| DA-YE | | | |
| DS-DOC | | | |
| DS-PRJ | | | |
| DS-OHP | | | |
| ADJ-M | | | |
| ADJ-C | | | |
| ADJ-Y | | | |
| ADJ-K | | | |

| | | TYP | | |
|---|---|---|---|---|
| | OFST-M | | | |
| | OFST-C | | | |
| | OFST-Y | | | |
| | OFST-K | | | |
| | SEG-ADJ | | | |
| | BC-ADJ | | | |
| | LGCR-IPU | | | |
| * | LAMP-DT | | | |
| * | GAIN-B | | | |
| * | GAIN-G | | | |
| * | GAIN-R | | | |
| * | TARGET-B | | | |
| * | TARGET-G | | | |
| * | TARGET-R | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Figure 3-1102 (b)**

## 4. Using Service Mode

Items to Select

a. The items are grouped into 1st-level, 2nd-level, and 3rd-level items, and 1st-level items remain displayed while the machine is in service mode.
b. To select an item, press its text box (reverse video on blue background).

Display

| | |
|---|---|
| <M> | |

Indicates a 2nd-level item that has been selected.

| | |
|---|---|
| <S> | |

Indicates in terms of N/M (N being the current screen number, and M being the total number of screens).

| | |
|---|---|
| <P> | |

Indicates the state of the printer.
SERVICE : service operation
JAM : paper jam
DOOR : door open
ERROR : service error
COPYING : copying
WAITING : initial rotation or the like
READY : copying ready while in service operation

| | |
|---|---|
| <R> | |

Indicates reader state
BUSY : copying not ready while in service operation
READY : copying ready while in service operation


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## Keys

| | |
|---|---|
| 0 through 9 | Enter 0 through 9 as when entering settings. |
| Reset | Press to end service mode (not valid at time of LCD-CHECK or KEY-CHECK) |
| Stop | Press to stop an operation. |
| Two-sided | Enter A(10) when entering settings in hexadecimal notation. |
| One-Touch Adjust | Enter B(11) when entering settings in hexadecimal notation. |
| Color Adjust | Enter C(12) when entering settings in hexadecimal notation. |
| Extended Zoom | Enter D(13) when entering settings in hexadecimal notation. |
| Frame Erase | Enter E(14) when entering settings in hexadecimal notation. |
| Color Create | Enter (F(15) when entering settings in hexadecimal notation. |

| | |
|---|---|
| Page Separate | Press for +100 in relation to the absolute value when entering settings. |
| Image Create | Press for –100 in relation to the absolute value when entering settings. |
| Marker | Press for +10 in relation to the absolute value when entering settings. |
| Synthesize | Press for –10 in relation to the absolute value when entering settings. |
| User Mode | Press for +1 in relation to the absolute value when entering settings. |
| OHP Interleaf | Press for –1 in relation to the absolute value when entering settings. |

| | |
|---|---|
| Start | Press to executing copying operation. |
| Pre-Heat | Press to switch between + and – when entering settings. |
| Interrupt | Press to move to the next 3rd-level screen when multiple 3rd-level screens exist. |

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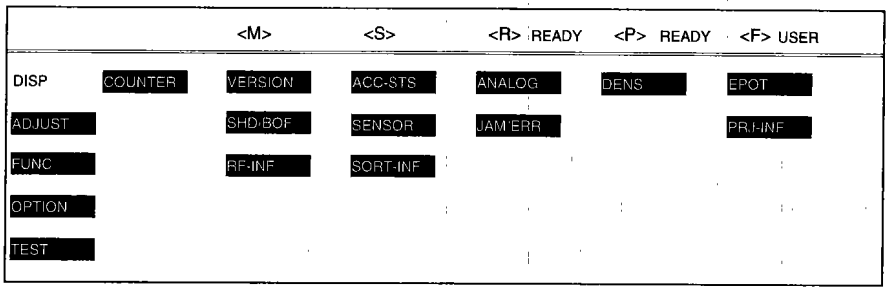
## B. Control Display Mode (DISPLAY)




| | | |
|---|---|---|
| 1 | VERSION | Indicates the ROM version. |
| 2 | ACC-STS | Indicates the state of the option. |
| 3 | ANALOG | Indicates the analog sensor measurements. |
| 4 | DENS | Developer density. |
| 5 | EPOT | Photosensitive drum surface potential control data. |
| 6 | SHD/BOF | Shading/Black Offset Data |
| 7 | SENSOR | Sensor/DC controller input port. |
| 8 | JAM/ERR | Indicates jam/error. |
| 9* | PRJ-INF | Indicates the state of the projector. |
| 10* | RF-INF | Indicates the state of the RDF. |
| 11* | SORT-INF | Indicates the state of the sorter. |

*Not indicated if the relevant option is not installed.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## 1. ROM Version Display

<M> VERSION <S> <R> READY <P> READY <F> USER

| | | | |
|---|---|---|---|
| DISP | COUNTER | R-CON | xxxx.xx.xx |
| | | DC-CON | xxxx.xx.xx |
| ADJUST | | SCANNER | xx |
| | | ECO | xx xx xx xx |
| FUNC | | IPU | xx.xx |
| | | SERIAL NO. | xxxxxxxxxxx |
| OPTION | | CNT-MODE | xx |
| | | RF | xxxx.xx.xx |
| TEST | | SORTER | xxxx.xx.xx |

| Item | Description | Remarks |
|---|---|---|
| R-CON | Indicates the version of the ROM (Q605, Q616, Q617, Q901) of the reader controller PCB. | XXXX . XX . XX<br>R&D control number<br>ROM version number<br>Language number |
| DC-CON | Indicates the version of the ROM (IC104) on the DC controller PCB. | |
| SCANNER | Indicates the version of the ROM (Q648) on the scanner driver PCB. | |
| ECO | Indicates the versions of the four ROMs on the IP-ECO PCB. | |
| IPU | Indicates the version of the ROM on the IPU. | |
| SERIAL No. | Indicates the serial number | For factory. |
| CNT-MODE | Indicates the type of control of the copy counter; see the next table. | |
| RF | Indicates the version of the ROM on the RF controller PCB. | XXXX . XX . XX<br>R&D control number<br>ROM version number<br>Language number |
| SORTER | Indicates the version of the ROM on the sorter controller PCB. | |

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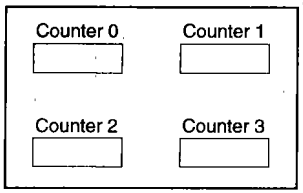
## CNT-MODE in Detail

| Counter Control | Counter 0 | Counter 1 | Counter 2 | Counter 3 |
|---|---|---|---|---|
| A | Total copy counter | BK copy counter | Color copy counter | Color printer counter |
| B | Total copy counter | BK copy counter | Large size color copy counter | Small size color copy counter |
| C | Total copy counter | Bk copy counter | Color copy counter | |
| D | Mono copy counter | Bk copy counter | Large size color copy counter | Small size color copy counter |
| E | Total copy counter | Bk copy counter | Color copy counter (excluds mono copies) | |




| Counter Control | Product Code | |
|---|---|---|
| | (TYPE 1) | (TYPE 2) |
| A | F13-1111/1211 | F13-1112/1212 |
| B | F13-1131/1231<br>F13-1191/1291<br>F13-1101/1201 | F13-1132/1232<br>F13-1192/1292<br>F13-1102/1202 |
| C | F13-1151/1251<br>F13-1161/1261<br>F13-1181/1281 | F13-1152/1252<br>F13-1162/1262<br>F13-1182/1282 |
| D | F13-1141/1241 | F13-1142/1242<br>F13-1122 |
| E | F13-1171/1271 | F13-1172/1272 |

## Language Number in Detail

| | X4 | X3 | X2 | X1 |
|---|---|---|---|---|
| DC controller PCB | 0 | 0 | 0 | 0 |
| Reader controller PCB | 0 | 1 | 1: Japanese<br>2: English<br>3: French<br>4: German<br>5: Danish<br>6: Dutch<br>7: Finish<br>8: Italian<br>9: Norwegian<br>A: Portuguese<br>B: Spanish<br>C: Swedish | 0: AB<br>1: Inch<br>2: A<br>3: all |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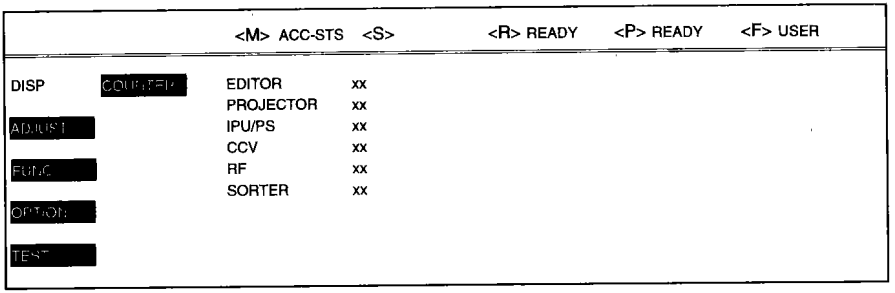
## 2. Option State Display




| Item | Description |
|---|---|
| EDITOR | Indicates the connection of the editor.<br>EDITOR=0 : Editor absent; however, I/F PCB present.<br>1 : Editor present.<br>2,4 : Editor absent; however, memory error present.<br>3,5 : Editor present; however, memory error present.<br>6 : Editor absent. I/F PCB absent, or memory error present.<br>7 : Editor present. I/F PCB absent, or memory error present. |
| PROJECTOR | Indicates the connection of the projector.<br>PROJECTOR=0 : Projector absent; however, I/F PCB present.<br>1 : Projector present.<br>2 : Projector absent. I/F PCB absent, or memory error present.<br>3 : Projector present; however, memory error present. |
| IPU/IPS | Indicates the connection of the IPU/PS-IPU.<br>IPU/PS= 0 : I/F PCB absent.<br>1 : I/F PCB only present.<br>2 : PS-IPU present.<br>3 : PS-IPU, extension board present.<br>4 : IPU present.<br>5 : PS-IPU, IPU, extension board present. |
| CCV | Indicates the connection of the control card V.<br>CCV=0 : CCV disable.<br>1 : CCV enable. |
| RF | Indicates the state of connection of the RDF.<br>RF=0: absent.<br>RF=1: present. |
| SORTER | Indicates the state of connection of the sorter.<br>SORTER=0: absent.<br>1: Sorter-D1<br>3: Stapler Sorter-F1<br>5: Sorter-D1+Buffer Pass Unit 1<br>7: Stapler Sorter-F1 + Buffer Pass Unit 1 |

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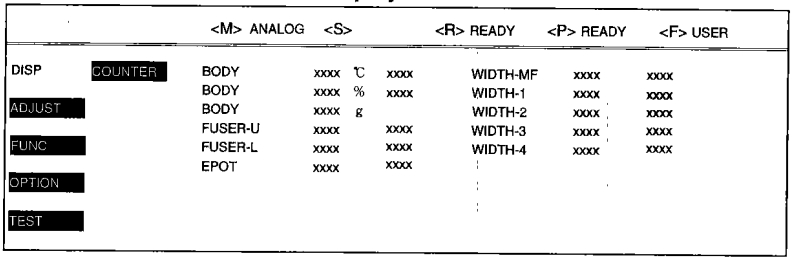
## 3. Analog Sensor Measurements Display




| Item | Description |
|---|---|
| BODY | Indicates the machine inside temperature.<br>BODY XXX°C XXX<br>Environment sensor output value (0 through 1023)<br>Environment sensor output conversion value (°C) |
| BODY | Indicates the machine inside humidity measured by the environment sensor.<br>BODY XXX% XXX<br>Environment sensor output value (0 through 1023)<br>Environment sensor output conversion value (%) |
| BODY | Indicates the machine inside humidity absolute value measured by the environment sensor (g).<br>BODY XX XXg<br>Decimal point<br>Ex) 0750g = 7.50g |
| FUSER-U | Indicates the upper fixing roller temperature (output of thermistor THM1).<br>FUSER-U XXX XXX<br>Output value of THM1 (0 to 1023)<br>Output conversion value of THM1 (°C) |
| FUSER-L | Indicates the upper fixing roller temperature (output of thermistor THM2).<br>FUSER-L XXX XXX<br>Output value of THM2 (0 to 1023)<br>Output conversion value of THM2 (°C) |
| EPOT | Indicates the drum surface potential measured by the potential sensor .<br>EPOT XXX XXX<br>Output value of the potential sensor (0 through 1023)<br>Output conversion value of the potential sensor (V) |
| WIDTH-MF<br>WIDTH-1<br>WIDTH-2<br>WIDTH-3<br>WIDTH-4 | Indicates the paper width conversion value (mm) of each cassette and multifeeder.<br>WIDTH-2 XXXX XXXX<br>Output value<br>Replacement value (mm) |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## 4. Developer Density Display

| | | <M> DENS | <S> | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | DENS-M<br>xxx | SGNL-M<br>xxx | REF-M<br>xxx | SGAIN-M<br>xxx | |
| ADJUST | | DENS-C<br>xxx | SGNL-C<br>xxx | REF-C<br>xxx | SGAIN-C<br>xxx | |
| FUNC | | DENS-Y<br>xxx | SGNL-Y<br>xxx | REF-Y<br>xxx | SGAIN-Y<br>xxx | |
| OPTION | | DENS-K<br>xxx | SGNL-K<br>xxx | REF-K<br>xxx | SGAIN-K<br>xxx | WINDOW<br>xxx |
| TEST | | | | | | |

| Item | Description | Remarks |
|---|---|---|
| DENS-M<br>DENS-C<br>DENS-Y<br>DENS-K | Indicates the density of the developer of each color inside the developing assembly.<br>+ : higher than the target value.<br>– : lower than the target value.<br>SGNL and REF stored in 'ATR-INIT' and value computed by SGNL and REF on the screen. | Unit: 0.1% |
| SGNL-M<br>SGNL-C<br>SGNL-Y<br>SGNL-K | Indicates the measurement (AD conversion value) of the current developer density of each color. | Measured for each copy. |
| REF-M<br>REF-C<br>REF-Y<br>REF-K | Indicates the measurement (AD conversion value) of the reference signal of each color. | Measured for each copy. |
| SGAIN-M<br>SGAIN-C<br>SGAIN-Y<br>SGAIN-K | Indicates the gain signal (initial value) of each color (AD conversion value). | |
| WINDOW | Indicates the correction coefficient of soiling of the window. The value decreases as the window of the black toner density sensor becomes soiled. | Standard: 100%<br>Normal if between 76 and 124. |

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## 5. Photosensitive Drum Surface Potential Control Data

| | | <M> EPOT | <S> | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | V00-M | VFF-M | VDC-M | VG-M | VBACK-M |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| ADJUST | | V00-C | VFF-C | VDC-C | VG-C | VBACK-C |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| FUNC | | V00-Y | VFF-Y | VDC-Y | VG-Y | VBACK-Y |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| OPTION | | V00-K | VFF-K | VDC-K | VG-K | VBACK-K |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| TEST | | | | | | |

| Item | Description | Remarks |
|---|---|---|
| VOO=M<br>VOO=C<br>VOO=Y<br>VOO=K | Indicates the target value of $V_D$ (when laser output is 00). | Unit: V |
| VFF=M<br>VFF=C<br>VFF=Y<br>VFF=K | Indicates the target value of $V_L$ (when laser output is ff). | Unit: V |
| VDC=M<br>VDC=C<br>VDC=Y<br>VDC=K | Indicates the target value of Vdc (developing bias DC component). | Unit: V |
| VG=M<br>VG=C<br>VG=Y<br>VG=K | Indicates the target value of Vg (grid bias). | Unit: V |
| VBACK=M<br>VBACK=C<br>VBACK=Y<br>VBACK=K | Indicates the de-fogging potential setting. | –7 ~ 7 |

- The measurements of V00 and VFF may be checked by 'EPC' under 'FUNC'.


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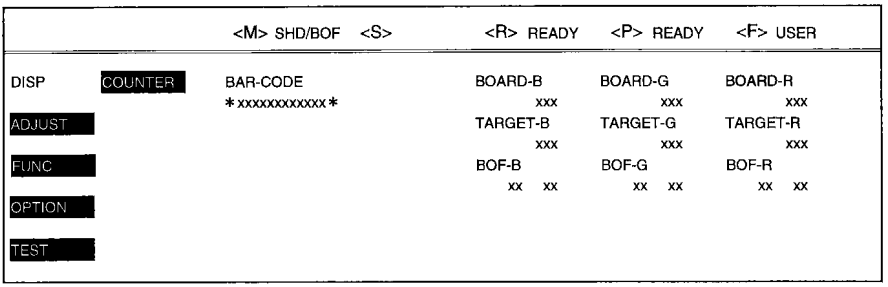
## 6. Shading/Black Offset Data




| Item | Description | Remarks |
|---|---|---|
| BAR-CODE | Indicates the bar-code setting of the standard white plate. | Indicated only after executing 'AUTO-ADJ' of 'CCD' under 'FUNC'. (not indicated by turning the power off and then on) |
| BOARD-B<br>BOARD-G<br>BOARD-R | Indicates the output of each CCD when the the standard white plate is read.<br>(output after A/D conversion) | |
| TARGET-B<br>TARGET-G<br>TARGET-R | Indicates the shading target value. | |
| BOF-B<br>BOF-G<br>BOF-R | Indicates the output of each CCD when the scanning lamp is off.<br>odd bit/even bit | |

## 7. Sensor/DC Controller Input Port

<M> SENSOR <S> 1/2 <R> READY <P> READY <F> USER

DISP COUNTER ADJUST FUNC OPTION TEST

| | |
|---|---|
| ITOP-A | x |
| ITOP-B | x |
| SC-HP | x |

<M> SENSOR <S> 2/2 <R> READY <P> READY <F> USER

DISP COUNTER ADJUST FUNC OPTION TEST

| | | | |
|---|---|---|---|
| 600000H | xxxxxxxx | 60000AH | xxxxxxxx |
| 600001H | xxxxxxxx | 60000BH | xxxxxxxx |
| 600002H | xxxxxxxx | 60000CH | xxxxxxxx |
| 600003H | xxxxxxxx | 60000DH | xxxxxxxx |
| 600004H | xxxxxxxx | 600010H | xxxxxxxx |
| 600005H | xxxxxxxx | 600011H | xxxxxxxx |
| 600008H | xxxxxxxx | 600012H | xxxxxxxx |
| 600009H | xxxxxxxx | | |

| Item | Description | Remarks |
|---|---|---|
| ITOP-A | Indicates the output of side A sensor (PS2). | When PS2 is detecting the transfer drum. |
| ITOP-B | Indicates the output of the side B sensor (PS3). | When PS3 is detecting the transfer drum. |
| SC-HP | Indicate the output of the scanner home position sensor (PS1). | When the scanner is at home position. |
| 600000 to 600012H | Indicates the input port of the DC controller PCB (600000H through 600012H). | |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NO1

| Address | | Item | Description | Remarks |
|---|---|---|---|---|
| 600000H | 7 | PS43D | Pre-phtosensitive drum cleaner paper sensor (PS43; TYPE 2 only) | Paper present: 1 |
| | 6 | — | For future use. | — |
| | 5 | | Buffer pass unit inlet paper sensor | Paper present: 1 |
| | 4 | | Buffer pass unit locking cam sensor | At HP: 1 |
| | 3 | DLVRY–0 | External delivery sensor (PS27) | Paper present: 0 |
| | 2 | DLVRY_1 | Internal delivery sensor (PS11) | Paper present: 1 |
| | 1 | SPRT | Separation sensor (PS6) | Paper present: 1 |
| | 0 | TRANS_2 | Post-transfer paper sensor (PS5) | Paper present: 1 |
| 600001H | 7 | TRANS_1 | Pre-transfer paper sensor (PS4) | Paper present: 1 |
| | 6 | RGST | Registration paper sensor (PS41) | Paper present: 1 |
| | 5 | OHP | OHP sensor (PS40) | Paper present: 1 |
| | 4 | MFPPD | Multifeeder pick-up sensor (PS8) | Paper present: 1 |
| | 3 | PS19D | Pick-up vertical path 1A sensor (PS19; CLC700) | Paper present: 1 |
| | 2 | PS26D | Pick-up vertical path 1B sensor (PS26; CLC800) | Paper present: 1 |
| | 1 | PS24D | Pick-up vertical path 2 sensor (PS24; CLC800) | Paper present: 1 |
| | 0 | PS25D | Pick-up vertical path 3 sensor (PS25; CLC800) | Paper present: 1 |
| 600002H | 7 | — | For future use. | — |
| | 6 | — | For future use. | — |
| | 5 | MFPD | Multifeeder paper sensor (PS14) | Paper present: 0 |
| | 4 | DUP_PD | Duplexing unit stacking assembly paper sensor (PS32; CLC800) | Paper present: 0 |
| | 3 | C4PD | Cassette 4 paper sensor (PS23; CLC800) | Paper present: 1 |
| | 2 | C3PD | Cassette 3 paper sensor (PS22; CLC800) | Paper present: 1 |
| | 1 | C2PD | Cassette 2 paper sensor (PS18; CLC700) | Paper present: 1 |
| | 0 | C1PD | Cassette 1 paper sensor (PS16) | Paper present: 1 |

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NO2

| Address | | Item | Description | Remarks |
|---|---|---|---|---|
| 600003H | 7 | — | For future use. | — |
| | 6 | — | For future use. | — |
| | 5 | PS33D | Duplexing unit feeding assembly paper sensor (PS33; CLC800) | Paper present: 0 |
| | 4 | PS31D | Duplexing unit reversing assembly outlet paper sensor (PS31; CLC800) | Paper present: 0 |
| | 3 | PS30D | Duplexing unit post-reversal paper sensor (PS30; CLC800) | Paper present: 1 |
| | 2 | PS29D | Duplexing unit pre-reversal paper sensor (PS29; CLC800) | Paper present: 1 |
| | 1 | PS39D | Delivery vertical path 2 sensor (PS39; CLC800) | Paper present: 1 |
| | 0 | PS28D | Delivery path 1 sensor (PS28; CLC800) | Paper present: 1 |
| 600004H | 7 | — | For future use. | — |
| | 6 | — | For future use. | — |
| | 5 | M6RDY | Pick-up motor READY | READY: 0 |
| | 4 | — | For future use. | — |
| | 3 | LSMRDY | Scanning motor READY | READY: 0 |
| | 2 | FXMRDY | Fixing motor READY | READY: 0 |
| | 1 | DRMRDY | Drum motor READY | READY: 0 |
| | 0 | MMRDY | Main motor READY | READY: 0 |
| 600005H | 7 | — | — | — |
| | 6 | — | — | — |
| | 5 | — | — | — |
| | 4 | — | — | — |
| | 3 | — | — | — |
| | 2 | — | — | — |
| | 1 | — | — | — |
| | 0 | — | — | — |


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NO3

| Address | | Item | Description | Remarks |
|---|---|---|---|---|
| 600008H | 7 | | Pre-phtosensitive drum cleaner paper sensor (PS43) presence / absence | Present: 1 |
| | 6 | — | For future use. | — |
| | 5 | — | For future use. | — |
| | 4 | — | Presence / absence of buffer | Present: 1 |
| | 3 | — | Transfer assembly frame door connector | Connected: 0 |
| | 2 | — | Duplexing drawer connector | Connected: 0 |
| | 1 | — | Transfer assembly drawer connector | Connected: 0 |
| | 0 | — | Fixing assembly drawer connector | Connected: 0 |
| 600009H | 7 | — | For future use. | — |
| | 6 | — | For future use. | — |
| | 5 | | Buffer door switch | Door open: 1 |
| | 4 | REV_DR | Reversal door switch | Door open: 1 |
| | 3 | FEED_DR | Feed door switch | Door open: 1 |
| | 2 | LEFT_DR | Left door switch | Door open: 0 |
| | 1 | RGHT_DR | Right door sensor | Door open: 0 |
| | 0 | DEL_DR | Delivery door sensor | Door open: 0 |
| 60000AH | 7 | — | — | — |
| | 6 | — | — | — |
| | 5 | — | — | — |
| | 4 | — | — | — |
| | 3 | — | — | — |
| | 2 | — | — | — |
| | 1 | — | — | — |
| | 0 | — | — | — |
| 60000BH | 7 | C4SZ1 | Cassette 4 paper length sensor (CLC800) | PS106 ON: 1 |
| | 6 | C4SZ0 | Cassette 4 paper length sensor 0 (CLC800) | PS105 ON: 1 |
| | 5 | C3SZ1 | Cassette 3 paper length sensor 1 (CLC800) | PS104 ON: 1 |
| | 4 | C3SZ0 | Cassette 3 paper length sensor 0 (CLC800) | PS103 ON: 1 |
| | 3 | C2SZ1 | Cassette 2 paper length sensor 1 (CLC700) | PS102 ON: 1 |
| | 2 | C2SZ0 | Cassette 2 paper length sensor 0 (CLC700) | PS101 ON: 1 |
| | 1 | — | — | — |
| | 0 | — | — | — |

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NO4

| Address | | Item | Description | Remarks |
|---|---|---|---|---|
| 60000CH | 7 | WTBD | Delivery toner feeding screw lock detection switch (MS4) | Screw lock: 0 |
| | 6 | WTONER | Waste toner full sensor (PS42) | Waste toner full: 1 |
| | 5 | WEBD | Fixing cleaning belt level sensor (PS10) | Belt absent: 1 |
| | 4 | OILEP | Fixing oil level sensor (PS9) | Oil absent: 0 |
| | 3 | BKTEP | Bk toner level sensor (TS4) | Low: 0 |
| | 2 | YTEP | Y toner level sensor (TS3) | Low: 0 |
| | 1 | CTEP | C toner level sensor (TS2) | Low: 0 |
| | 0 | MTEP | M toner level sensor (TS1) | Low: 0 |
| 60000DH | 7 | — | Polishing roller drive motor overcurrent detection | Overcurrent: 1 |
| | 6 | — | Cleaning assembly reciprocating motor overcurrent | Overcurrent: 0 |
| | 5 | — | Hopper motor overcurrent detection | Overcurrent: 0 |
| | 4 | — | Transfer drum cleaner motor overcurrent detection | Overcurrent: 0 |
| | 3 | — | Brush drive motor cover current detection | Overcurrent: 1 |
| | 2 | — | For future use. | — |
| | 1 | — | — | — |
| | 0 | — | — | — |
| 600010H | 7 | C4LFU | Cassette 4 lifter sensor (PS21; CLC800) | Lifter up: 1 |
| | 6 | C3LFU | Cassette 3 lifter sensor (PS20; CLC800) | Lifter up: 1 |
| | 5 | C2LFU | Cassette 2 lifter sensor (PS17; CLC700) | Lifter up: 1 |
| | 4 | C1LFU | Cassette 1 lifter sensor (PS15) | Lifter up: 1 |
| | 3 | PGHP | Paper jogging guide home position sensor (PS34; CLC700) | At HP: 1 |
| | 2 | BMTRHP | Brush drive motor home position sensor (PS7) | At HP: 1 |
| | 1 | A-LEG | A sensor (PS2) | On side A: 1 |
| | 0 | B-LEG | Side B sensor (PS3) | On side B: 1 |


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NO5

| Address | | Item | Description | Remarks |
|---|---|---|---|---|
| 600011H | 7 | — | Fixing heater error low | Error: 1 |
| | 6 | — | Fixing heater error up | Error: 1 |
| | 5 | — | Shutoff error | Error: 1 |
| | 4 | — | SSR1 error | Error: 1 |
| | 3 | — | SSR2 error | Error: 1 |
| | 2 | — | For future use. | — |
| | 1 | DRUMHP | Photosensitive drum home position sensor (PS38) | At HP: 1 |
| | 0 | KEYSW | Key switch | Key switch on: 0 |
| 600012H | 7 | — | Counter mode 4 | Counter up: 1 |
| | 6 | — | Counter mode 3 | Counter up: 1 |
| | 5 | — | Counter mode 2 | Counter up: 1 |
| | 4 | — | Counter mode 1 | Counter up: 1 |
| | 3 | — | For future use. | — |
| | 2 | — | For future use. | — |
| | 1 | — | For future use. | — |
| | 0 | — | For future use. | — |

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## 8. Jam/E Display

- 1st page (jam history)

| | | <M> JAM/ERR | <S> 1/3 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | JAM | <PLACE> | <REASON> | | CLEAR |
| | | | xxxx | xxxx | | |
| ADJUST | | | | | | |
| FUNC | | <HIST-0> | <HIST-1> | <HIST-2> | <HIST-3> | <HIST-4> |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| OPTION | | <HIST-5> | <HIST-6> | <HIST-7> | <HIST-8> | <HIST-9> |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| TEST | | | | | | |

- 2nd page (E indication)

| | | <M> JAM/ERR | <S> 2/3 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | ERROR | <CODE> | <E000> | <E004> | <E012> |
| | | | xxxx | xxxx | xxxx | xxxx |
| ADJUST | | <E020> | <E030> | <E040> | <E061> | <E071> |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| FUNC | | <E072> | <E073> | <E190> | | |
| | | xxxx | xxxx | cccc | | |
| OPTION | | | | | | |
| TEST | | | | | | <E305 > |
| | | | | | | xxxx |

- 3rd page (E indication history)

| | | <M> JAM/ERR | <S> 3/3 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | ERROR | | | | CLEAR |
| ADJUST | | <HIST-0> | <HIST-1> | <HIST-2> | <HIST-3> | <HIST-4> |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| FUNC | | <HIST-5> | <HIST-6> | <HIST-7> | <HIST-8> | <HIST-9> |
| | | xxxx | xxxx | xxxx | xxxx | xxxx |
| OPTION | | | | | | |
| TEST | | | | | | |


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| Item | Description |
|---|---|
| <PLACE> | Indicates the location of a jam (paper position) in code. |
| <REASON> | Indicates the cause/location of a jam; see next page. |
| <CLEAR> | CLEAR on page 1/3 clears the jam history.<br>CLEAR on page 3/3 clears the error code (E indication) history. |
| <HIST-0> to<br><HIST-9> | Indicates the history of jams (REASON).<br>• HIST-0 represents the most recent jam detected. |
| <CODE> | Indicates the results of self diagnosis (E indication). |
| <E000><br><E004><br><E012><br><E020><br><E030><br><E040><br><E061><br><E071><br><E072><br><E073><br><E190><br><E305> | Details of E000<br>Details of E004<br>Details of E012<br>Details of E020<br>Details of E030<br>Details of E040<br>Details of E061<br>Details of E071<br>Details of E072<br>Details of E073<br>Details of E190<br>Details of E305<br>} See p. 3-292. |
| <HIST-0> to<br><HIST-9> | Indicates the history of error codes (E indication).<br>• HIST-0 represents the most recent error indication. |

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PLACE Codes

The PLACE codes are expressed in hexadecimal notation. You may convert them into binary notation to identify the location of the jam.

- 00H = 0000000000000000
  - BIT 0
  - BIT 8
  - BIT 15

| BIT | JAM Location |
|---|---|
| BIT 0 = 1 | near cassette 1 |
| BIT 1 = 1 | near cassette 2 |
| BIT 2 = 1 | near cassette 3 |
| BIT 3 = 1 | near cassette 4 |
| BIT 4 = 1 | near multifeeder assembly |
| BIT 5 = 1 | near duplexing unit |
| BIT 6 = 1 | near pickup vertical path |
| BIT 7 = 1 | near multifeeder feeding assembly |
| BIT 8 = 1 | near pre-registration roller |
| BIT 9 = 1 | near transfer drum |
| BIT 10 = 1 | near separation assembly |
| BIT 11 = 1 | near fixing assembly |
| BIT 12 = 1 | near delivery vertical path |
| BIT 13 = 1 | near duplexing tray |
| BIT 14 = 1 | near buffer unit |
| BIT 15 = 1 | near sorter |

For instance, if 'JAM, PLACE=2100H', 2100H = 0010 0001 0000 0000 , pointing to a point between the duplexing tray assembly and the pre-registration roller.

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**REASON Codes**

| first 2 digits: jam Cause code | Jam |
|---|---|
| 01xx | Delay jam |
| 02xx | Stationary jam |
| 03xx | Paper at time of power-on or opening/closing of front/ pick-up assembly/delivery assembly door |
| 04xx | Wrong point of attraction jam |
| 05xx | Sorter jam |
| FFxx | Opening of front/pick-up assembly/delivery assembly door during copying assembly |

**1. High-Order 2 Digits 01, 02, or 03.**

| last 2 digits: jam Sensor code | Sensor |
|---|---|
| xx01 | Vertical path assembly from cassette 4 |
| xx02 | Vertical path assembly from cassette 3 |
| xx03 | Vertical path assembly from duplexing unit |
| xx04 | Vertical path assembly from cassette 2 |
| xx05 | No. 1 feeding assembly (horizontal path assembly) |
| xx06 | For future use. |
| xx07 | Pre-registration sensor |
| xx08 | Post-transfer sensor |
| xx09 | Pre-transfer sensor |
| xx0A | Separation sensor |
| xx0B | Internal delivery assembly |
| xx0C | External delivery assembly |
| xx0D | Delivery vertical path assembly 1 |
| xx0E | Delivery vertical path assembly 2 |
| xx0F | Pre-reversal sensor |

| last 2 digits: jam Sensor code | Sensor |
|---|---|
| xx10 | Post-reversal sensor |
| xx11 | Reversing assembly outlet sensor |
| xx12 | Duplexing feeding assembly sensor |
| xx18 | Buffer sensor assembly |
| xx20 | Pre-cleaner paper sensor |

**2. High-Order 2 Digits 05**

| last 2 digits: jam Sensor code | Sensor |
|---|---|
| xx03 | Feeding delay jam |
| xx04 | Feeding stationary jam |
| xx06 | Staple jam |
| xx07 | Power-on jam |
| xx08 | Door open (feeding) |
| xx09 | Door open (non feeding) |
| xx0A | Outside bin jam |

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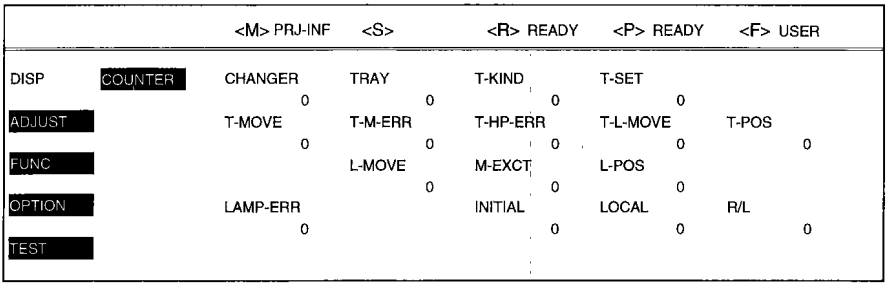
## 9. Projector State Display




| Item | Description | State |
|---|---|---|
| CHANGER | Presence/absence of rotary changer | 1: present |
| TRAY | Presence/absence of slide tray | 1: present |
| T-KIND | Type of tray | 1: 140<br>0: 80 |
| T-SET | Presence of slide | 1: present |
| T-MOVE | Tray movement | 1: moving |
| T-M-ERR | Tray drive mechanical error | 1: error |
| T-HP-ERR | Tray home position error | 1: error |
| T-L-MOVE | Tray local movement | 1: moving |
| T-POS | Tray position | 0: home position<br>1: increasing by 1 for each feeding operation |
| L-MOVE | Lens movement | 1: moving |
| M-EXCT | Motor excitation | 1: excited |
| L-POS | Lens position | 0: home position |
| LAMP-ERR | Lamp open-circuit detection | 1: open circuit |
| INITIAL | Initialization | 1: initializing |
| LOCAL | Local movement | 1: moving |
| R/L | Remote/local | 0: remote<br>1: local |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## 10. RDF State Display

| | | <M> RF-INF | <S> | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|---|
| DISP | COUNTER | STATUS-1 | STATUS-2 | STATUS-3 | STATUS-4 | |
| | | xx | xx | xx | xx | |
| ADJUST | | DOC-1 | DOC-2 | DOC-3 | DOC-4 | |
| | | xx | xx | xx | xx | |
| FUNC | | ERROR | JAM | | | |
| | | xx | xx | | | |
| OPTION | | ALARM-1 | ALARM-2 | ALARM-3 | ALARM-4 | |
| | | xx | xx | xx | xx | |
| TEST | | | | | | |

| Item | Description |
|---|---|
| STATUS-1/2/3/4 | For R&D |
| DOC-1/2/3/4 | For R&D |
| ERROR | Indicates the error code from the RDF controller PCB.<br>01H: equivalent of E401<br>02H: equivalent of E402<br>03H: equivalent of E403<br>04H: equivalent of E404<br>05H: equivalent of E405<br>06H: no equivalent<br>07H: equivalent of E407<br>11H: equivalent of E411<br>21H: equivalent of E400 |
| JAM | See the RDF-E1 Service Manual. |
| ALARM-1/2/3/4 | Indicates the alarm code from the RDF controller PCB.<br>01H: re-circulating bar idle swing<br>02H: no equivalent<br>03H: separation failed<br>04H: separation skew<br>05H: no equivalent |

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## 11. Sorter state Display

<M> SORT-INF <S> <R> READY <P> READY <F> USER

DISP COUNTER
ADJUST
FUNC
OPTION
TEST

| STATUS-1 | STATUS-2 | STATUS-3 | STATUS-4 |
|---|---|---|---|
| xx | xx | xx | xx |
| ERROR | JAM | | |
| xx | xx | | |
| ALARM-1 | ALARM-2 | ALARM-3 | ALARM-4 |
| xx | xx | xx | xx |

| Item | Description |
|---|---|
| STATUS-1/2/3/4 | For R&D |
| ERROR | See the Stapler Sorter-F1/Sorter-D1 Service Manual. |
| JAM | Indicates the jam code from the sorter controller PCB.<br>03H: feeding delay jam<br>04H: feeding stationary jam<br>06H: staple jam<br>07H: power-on jam<br>08H: door open jam (feeding)<br>09H: door open jam (non feeding) |
| ALARM-1/2/3/4 | Indicates the alarm code from the sorter controller PCB.<br>ALARM-1<br>02H: overstacking<br>ALARM-2<br>02H: staple jam<br>03H: stapler safery protective mechanism on<br>05H: stapling overstacking<br>07H: mixed paper sizes (horizontal)<br>08H: no stapling unit<br>0AH: no staple<br>ALARM-3/4<br>For future |


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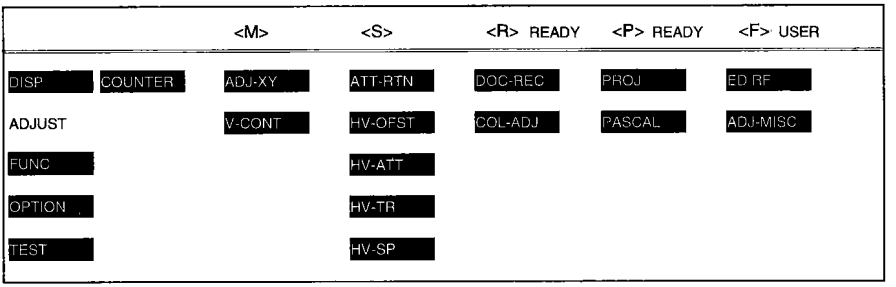
## C. Adjustment Mode (ADJUST)




| | | |
|---|---|---|
| 1 | ADJ-XY | Adjustment of the image read start position. |
| 2 | ATT-RTN | Adjustment of attraction rotation. |
| 3 | DOC-REC | Adjustment of the original detection area/slice level. |
| 4 | PROJ* | Projector area adjustment. |
| 5 | ED/RF | Adjustment of the editor. |
| 6 | V-CONT | Adjustment of the original detection area/slice level. |
| 7 | HV-OFST | Adjustment of the high-voltage output of attraction/transfer/separation. |
| 8 | COL-ADJ | Correction of the color balance adjustment for the user. |
| 9 | PASCAL | Decision on use or not use the data obtained by automatic gradation correction control and display of data related to automatic gradation correction control. |
| 10 | ADJ-MISC | (Adjustment other than the above.) |
| 11 | HV-ATT | Fine-adjustment of the attraction high-voltage output by condition. |
| 12 | HV-TR | Fine-adjustment of the transfer high-voltage output by condition. |
| 13 | HV-SP | Fine-adjustment of the separation high-voltage output by condition. |

*Not indicated if the projector is not installed.

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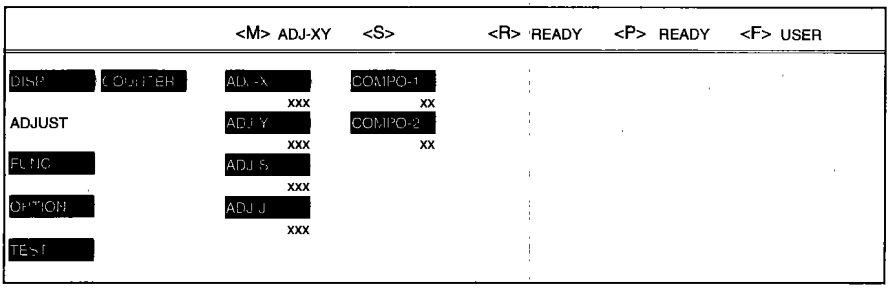
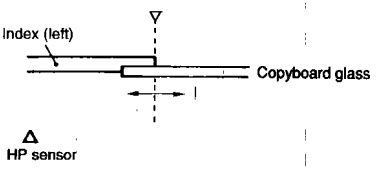
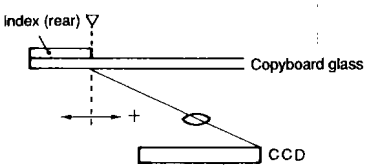
## 1. Adjusting the Image Read Position Start Position




| Item | Description | Settings |
|---|---|---|
| ADJ-X | Make adjustments so that the image read start position matches the reference point on the copyboard glass. Fine-Adjusting the Distance between the Scanner HP Sensor and the Read Start Position<br>• unit: number of steps of the stepping motor.<br>• See next page.<br>  | –200 ~ +200<br>(–3.9 ~ +3.9mm)<br>unit: 0.107 mm<br>(approx.) |
| ADJ-Y | Fine-Adjusting the CCD Read Start Position<br>• unit: pixels<br>• See next page.<br>  | –100 ~ +100<br>(–2.5 ~ +2.5mm)<br>unit: 0.06 mm (approx.) |
| ADJ-J | Adjusting the Initial Rotation Period of the Scanning Motor | 0 ~ +500<br>unit: 0.1 ms (approx.) |

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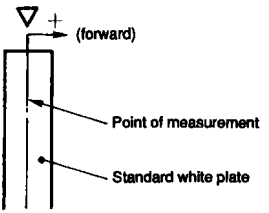
| Item | Description | Settings |
|---|---|---|
| ADJ-S | Fine-Adjusting the Position of Measuring the Standard White Plate for Shading Correction Data<br>• unit: number of steps of the stepping motor.<br>• Scratches or dirt on the standard white plate vertical white lines on copies conspicuous; this adjustment shifts the point of measurement taken by ADJ-S.<br>  <br> | 0 ~ 45<br>(0 ~ 4.8mm)<br>unit: 0.107 mm<br>(approx.) |
| COMPO-1 | For R & D (not used) | |
| COMPO-2 | For R & D (not used) | |

**Adjusting the Image Read Start Position**

You must check the point of attraction before making this adjustment.

1) Before activating service mode, set the original detection to 'OFF'.
2) Bring up the ADJ-XY screen, and press the Copy Start key.
   - the appropriate copy mode is set automatically, and a copy is made with a shift of about 50 mm as shown in Figure 3-1103.
3) If any part of the image is missing, decrease ADJ-X, ADJ-Y.
4) If areas outside the image area is copied, increase ADJ-X, ADJ-Y.

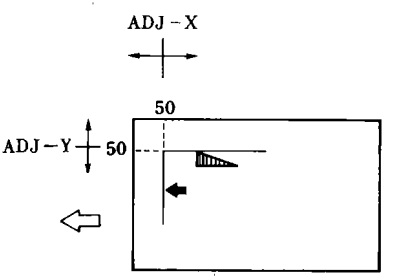
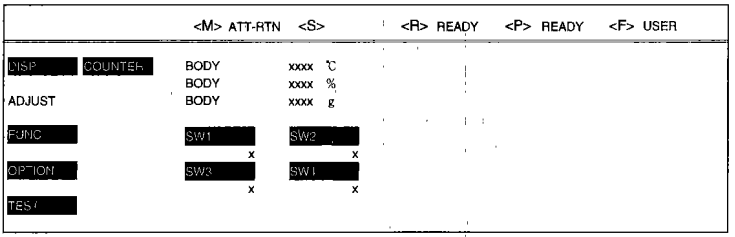



**Figure 3-1103**

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

## 2. Attraction Rotation




| Item | Description | Remarks |
|---|---|---|
| BODY (°C) | Indicates the machine internal temperature measured by the environment sensor. | Identical to the notation under 'DISPLAY→ANALOG'. |
| BODY (%) | Indicates the machine internal humidity measured by the environment sensor. | |
| BODY (g) | Indicates the machine internal absolute humidity (g) measured by the environment sensor. | |
| SW1<br>SW2<br>SW3<br>SW4<br>(See note) | A single attraction rotation will be added to the normal sequence according to each switch setting regardless of the type of copy paper (plain or otherwise); see the table below. (The sequence will be identical to the sequence used in thick paper/special paper mode.) | |

- Details of SW1 through SW4
  A single attraction rotation will be added when each of the switches in the following table is set to '1' and with the mode selected for the checked (✔) cells.

| | Copy mode (one-sided/two-sided) | | Copy mode (number of colors) | |
|---|---|---|---|---|
| | 1st side of one-sided/two-sided | 2nd side of two-sided | Mono | 2 or more |
| SW1 | ✔ | | | ✔ |
| SW2 | | ✔ | | ✔ |
| SW3 | ✔ | | ✔ | ✔ |
| SW4 | | ✔ | ✔ | ✔ |

**For example,**

- If only SW2 is set to '1', an attraction rotation will be added to copying on the second side of a two-sided copy made in full color.
- If both SW3 and SW4 are set to '1', an attraction rotation will be added to all copying modes.

**Note:**

If you replaced a PCB or cleared a RAM, the values are reset to standard values, necessitating re-input. Make sure you record the items and the values whenever you must change the values on the service label in consideration of this.

**Reference**

- This service mode will prove effective when correcting color displacement (magenta displacement/unevenness) caused by faulty attraction.
- Use 'TEST→PG→TYPE=6' (grid) in service mode to check for magenta displacement.
- Use 'TEST→PG→TYPE=5' (halftone), 'DENS-M/C/Y/K=25', or 'TXPH=1' in Service Mode to check for magenta unevenness.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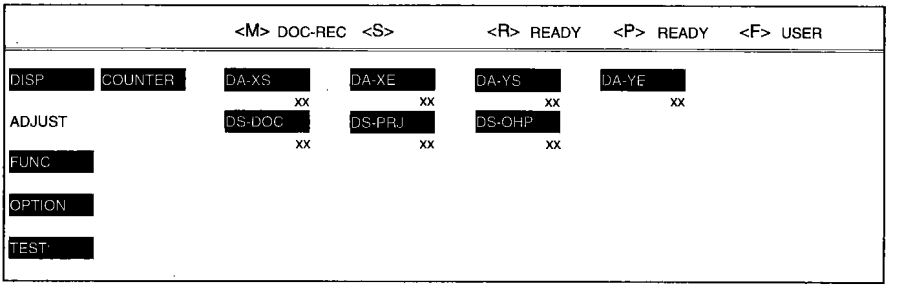
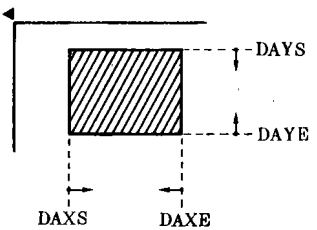
## 3. Adjusting the Original Detection Area/Slice Level




| Item | Description | Remarks |
|---|---|---|
| DA-XS<br>DA-XE<br>DA-YS<br>DA-YE<br>(See note) | Adjusting the Original Detection Area<br>An original must remain level on copyboard glass in original detection mode; otherwise, the edges of the original turn out black on the copy. Set the amount of frame erasure in this mode.<br>  <br><br>Any changes made in this mode affects the amount of frame erasure in original detection mode when the projector is used. | -99 ~ 99<br>(0 ~ 6.3mm)<br>reference XS=24<br>XE=8<br>YS=32<br>YE=24<br>unit: 0.06 mm<br>(approx.) |
| DS-DOC<br>DS-PRJ<br>DS-OHP<br>(See note) | Adjusting the Slice Level in Original Detection<br>You can set any slice level for original detection.<br>A higher slice level will increase the original detection ability but can lead to wrong detection.<br>Use it to detect the projection area when the projector is used.<br>Use it to detect 6×6 ot 8×10 film placed on the copyboard glass when the projector is used. | 0 ~ 31<br>(density level 0 ~ 248)<br>reference value:<br>DS-DOC=21<br>PRJ=28<br>OHP=22 |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

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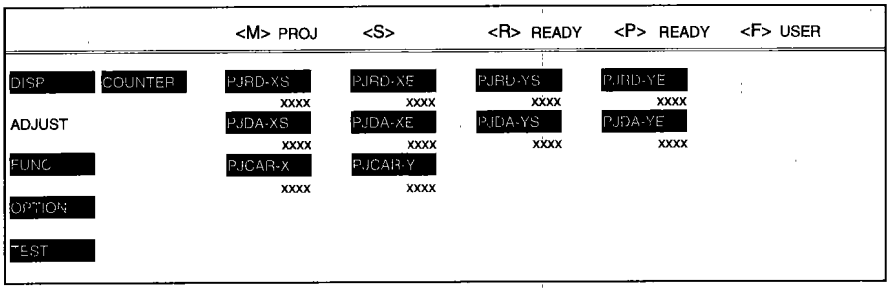
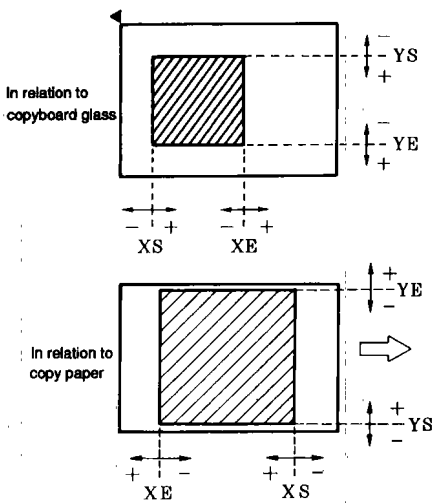
## 4. Adjusting the Projector Area




| Item | Description | Settings |
|---|---|---|
| PJRD-XS<br>PJRD-XE<br>PJRD-YS<br>PJRD-YE | Use it to fine adjust the read area when the original detection mechanism is off while the projector is in use or if original detection fails when the original detection mechanism is on.<br>  | –300 ~ +300<br>(–19.0 ~ +19.0mm)<br>unit: 0.06 mm<br>(approx.; in reference to copyboard glass)<br>reference value: 0 |

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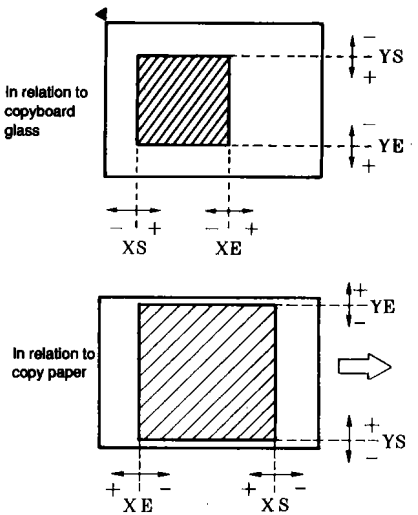
| Item | Description | Settings |
|---|---|---|
| PJDA-XS<br>PJDA-XE<br>PJDA-YS<br>PJDA-YE | Use it to fine-adjust the area measured for original detection when the original detection is on with the projector in use.<br>• Use it also on the read area with the original detection mechanism off in copyboard mode.<br>• The area at the time when the reference value (0) is used is 5 mm within the Fresnel lens.<br>  | –99 ~ +99<br><br>XS, YE<br>(6.3 ~ +6.3mm)<br>unit: 0.11 mm<br>(approx.)<br><br>YS, XE<br>(–10.9 ~ +10.9mm)<br>unit: 0.11 mm<br>(approx.) |
| PJCAR-X<br>PJCAR-Y | Use it to correct the position of projection when original detection is off while the auto changer is in use. | –100 ~ +100<br>reference: 0 |

**Reference:**

PJDA is adjustment of the area to be measured, but NOT adjustment to the area measured. To erase the black frame on copies or to decrease it, adjust 'YE' under 'DA-XS' of 'DOC-REC'.

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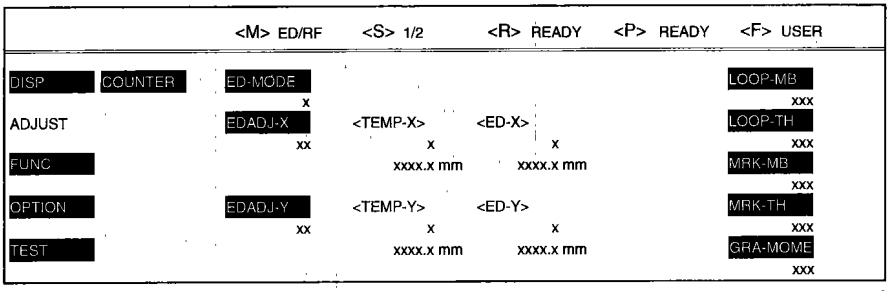
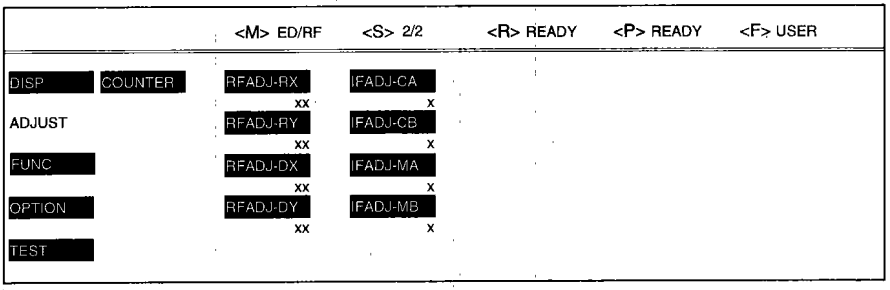
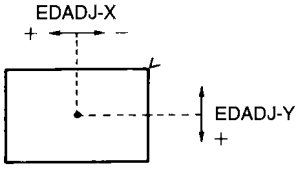
## 5. Adjusting the Editor




| Item | Description | Settings |
|---|---|---|
| ED-MODE | Switching Editor Operation Mode<br>0: input prohibit<br>1: 1-point input<br>2: continuous input<br>(Use to make checks during adjustment.) | |
| EDADJ-X<br><TEMP-X><br><ED-X><br>EDADJ-Y<br><TEMP-Y><br><ED-Y> | Editor input coordinates in the sub scanning direction (X direction)<br>Editor sub scanning direction coordinate input value and mm conversion value<br>Editor sub scanning direction adjusted value and mm conversion value<br>Editor input coordinates in the main scanning direction (Y direction)<br>Editor main scanning direction coordinate input value and mm conversion value<br>Editor main scanning direction adjusted value and mm conversion value<br>  | -99 ~ +99<br>-12.6 ~ +12.6 mm<br>unit: 0.13 mm (approx.)<br>standard: 0 |

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| Item | Description | Settings |
|---|---|---|
| LOOP-MB (See note) | Use it to change the processing method used to read images into memory for coloring in area specification/color create Mode. A higher setting lets you fill gaps easily; if the setting is too high, however, the color may spread over the gap. | 0 ~ 3<br>standard: 0 |
| LOOP-TH (See note) | Use it to adjust the slice level adjustment value for binarization used when reading images into memory for coloring in area specification/color create mode. A higher setting lets you read thinner lines. | 0 ~ 225<br>standard: 192 |
| MRK-MB | Use it to change the image data processing method used when reading images into memory for high-light/point specification mode. A higher setting lets you fill gaps easily. | 0 ~ 3<br>standard: 0 |
| MRK-TH | Use it to adjust the slice level for binarization used for reading images into memory in high-light/point specification mode. | 0 ~ 225<br>standard: 128 |
| GRA-MODE | When gradation processing is executed in a copier equipped with an IP-ED PCB, a graduated color is deposited in non-text areas so as to avoid changing the hue of the text.<br>0: conventional<br>1: deposit graduated color in entire area (of original; as if in the absence of IP-ED PCB) | 0 ~ 1<br>standard: 0 |
| RFADJ-RX (Notes 1/2) | Use it to adjust the original read start position (X direction) for pick-up from the RDF tray. | 0 ~ 99<br>unit: 0.1 mm<br>standard: 0 |
| RFADJ-RY (Notes 1/2) | Use it to adjust the original read start position (Y direction) for pick-up from the RDF tray. | 0 ~ 99<br>unit: 0.1 mm<br>standard: 23 |
| RFADJ-DX (Notes 1/2) | Use it to adjust the original read start position (X direction) for pick-up from RDF manual feeding. | 0 ~ 99<br>unit: 0.1 mm<br>standard: 0 |
| RFADJ-DY (Notes 1/2) | Use it to adjust the original read start position (Y direction) for pick-up ROM RDF manual feeding | 0 ~ 99<br>unit: 0.1 mm<br>standard: 23 |
| IFADJ-CA/CB/ MA/MB | For R&D (not used) | |

**Note 1:**

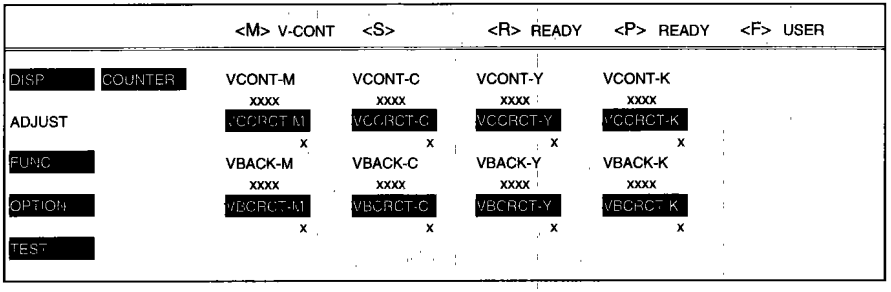
The value of the item returns to its standard value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Note 2:**

Execute the item when installing an RDF or when adjusting the original stop position or horizontal registration. Further, you must perform the following if the ROM of the reader controller is version 13.04 or earlier:

a. Set '23' (initial value) to '-DY' under 'RFADJ-RY' before starting installation.
b. Set 'center shift' to 'ON' when adjusting the horizontal registration.

## 6. Adjusting the Photosensitive Drum Surface Potential Contrast




| Item | Description | Remarks |
|---|---|---|
| VCONT-M<br>VCONT-C<br>VCONT-Y<br>VCONT-K | Indicates the current value of the target potential contrast | |
| VCCRCT-M<br>VCCRCT-C<br>VCCRCT-Y<br>VCCRCT-K<br>(See note) | Fine-Adjusting the Contrast Potential Target Value<br>• Effective only in auto contrast mode (VCONT=0 under ADJ-MISC). | –8 ~ +8<br>reference: 0<br>+: darker<br>–: lighter |
| VBACK-M<br>VBACK-C<br>VBACK-Y<br>VBACK-K | Indicates current value of de-fogging potential | |
| VBCRCT-M<br>VBCRCT-C<br>VBCRCT-Y<br>VBCRCT-K<br>(See note) | Adjusting the defogging potential (Vback) | –8 ~ +8<br>reference: 0<br>+: darker<br>–: lighter |

**Reference**

Vcont + Vcrct + Vtmpr = (VD – VL) – Vback

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.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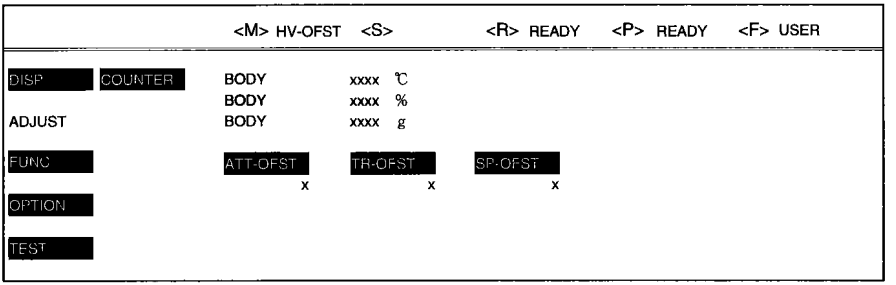
## 7. Adjusting the High-Voltage Output of Attraction/Transfer/Separation




| Item | Description | Remarks |
|---|---|---|
| BODY (°C) | Indicates the machine internal temperature measured by the environment sensor. | Identical to the notation under 'DISPLAY→ANALOG'. |
| BODY (%) | Indicates the machine internal humidity measured by the environment sensor. | |
| BODY (g) | Indicates the machine internal absolute humidity (g) measured by the environment sensor. | |
| ATT-OFST (See note) | Adjusting the high-voltage output for attraction. | Setting :–2 to +2<br>Unit :2.5 µA<br>Standard: 0 |
| TR-OFST (See note) | Adjusting the high-voltage output for transfer. | Setting :–5 to +5<br>Unit :0.5 µA<br>Standard: 0 |
| SP-OFST (See note) | Adjusting the high-voltage output for separation (DC component). | Setting :–4 to +2<br>Unit :60 µA<br>Standard: 0 |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Reference**

- 'ATT-OFST' corresponds to 'HV-ATT' of ROM version 2 or earlier.
- 'TR-OFST' corresponds to 'HV-TR' of ROM version 2 or earlier.

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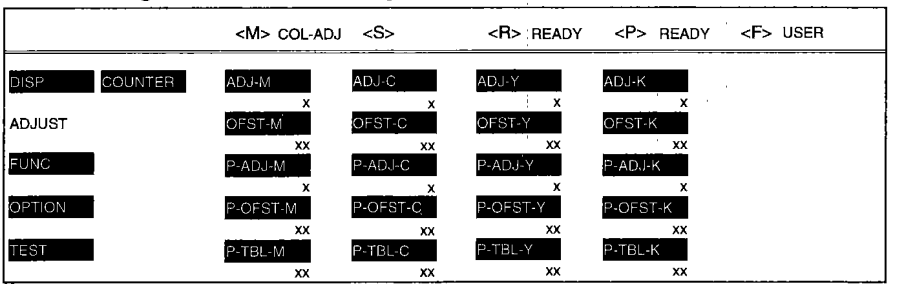
## 8. Correcting the Color Balance Adjustment for the User




| Item | Description | Settings |
|---|---|---|
| ADJ-M<br>C<br>Y<br>K<br>(See note) | Correcting the Color Balance Adjustment for the User<br>• You must return the color balance for the user to '0' before making adjustments in this mode.<br>• Make adjustments as indicated in the Image Adjustment Basic Procedure.<br>Note:<br>The reference value is automatically set in relation to 'OPTION' -> 'R-OPT' -> 'NEW-COL'. | –8 ~ +8<br>reference:<br>if NEW-COL=1,<br>M=0, C=0, Y=0, K=0<br>if NEW-COL=0,<br>M=–1, C=0, Y=–3, K=0<br>+: darker<br>–: lighter |
| OFST-M<br>C<br>Y<br>K<br>(See note) | Adjusting the Density of the Light Area and Color Balance<br>• If fogging is noted, decrease the setting.<br>• To enhance reproduction of images of extremely low density, increase the setting.<br>• To increase the reproducibility of areas where the | –16 ~ +16<br>reference: M=2<br>C=0<br>Y=0<br>K=0 |
| P-ADJ-M<br>C<br>Y<br>K<br>(Notes 1/2) | Correcting the color Balance Adjustment for Output from the Controller<br>• Be sure to return color balance adjustment for the user to '0' before using this mode.<br>• Make adjustments according to the Image Adjustment Basic Procedure. | –8 ~ +8<br>reference:<br>if NEW-COL=1,<br>M=1, C=0, Y=–3, K=0<br>if NEW-COL=0,<br>M=0, C=0, Y=0, K=0<br>+: darker<br>–: lighter |
| P-OFST-M<br>Y<br>K<br>(Notes 1/2) | Adjusting Color Balance and Light Areas for Output from C the Controller<br>• Make adjustments according to the Image Adjustment Basic Procedure.<br>• If fogging is noted, increase the value.<br>• To increase the density (if appreciably light), decrease the value. | –16 ~ +16<br>Standard: 0<br>reference: M=2<br>C=0<br>Y=0<br>K=0 |
| P-TBL-M<br>C<br>Y<br>K | Fine-Adjusting the Hue to simulate Offset Printing<br>Compare the M, C, Y, and K each against printed material;<br>If the print-out is lighter, increase 'P-TBL-M/C/Y/K'<br>If the print-out is darker, decrease 'P-TBL-M/C/Y/K'. | –3 ~ +3<br>Standard: 0<br>See the descriptions for 'OPTION' -> 'R-OPT' -> 'MANAGE'. |

**Note 1:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Note 2:**

Here, the conditions of use vary according to the setting of 'EM-TYPE' of 'REMOTE' under 'OPTION'.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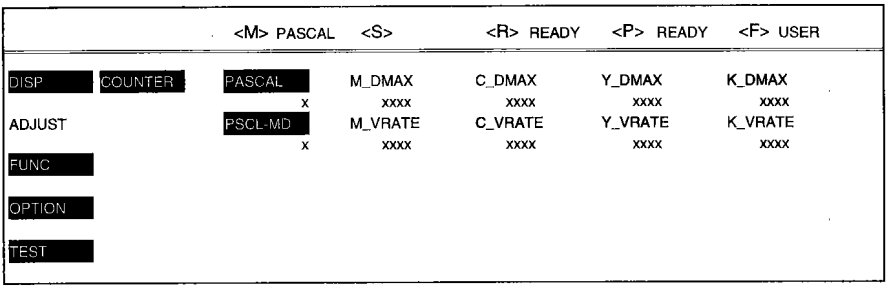
## 9. PASCAL (auto gradation correction control)

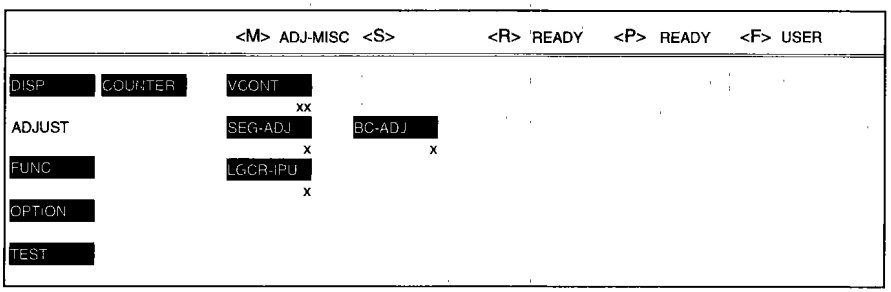



| Item | Description | Remarks |
|---|---|---|
| PASCAL | Specifies whether to use the data for the contrast potential and gradation correction obtained by automatic gradation correction control.<br>0 : Use.<br>1 : Do not use. | Normally, '1'; but '0' only when adjusting the image. |
| M-DMAX<br>C-DMAX<br>Y-DMAX<br>K-DMAX | Indicates the result of comparing the solid density measured when automatic gradation correction control is executed against the design value in terms of %. | Optimum: 75 or higher. |
| RSCL-MD | Use it to smooth out the gradation area when the output is from the controller.<br>0 : Conventional<br>1 : Do not use<br>2 : Smoothes out gradation areas (however, copying will slow down by about 0.5 sec)<br>Note:<br>If '2' is set, you need to execute auto gradation correction in user mode. | Standard: 0 |
| M-VRATE<br>C-VRATE<br>Y-VRATE<br>K-VRATE | Indicates the control value used to determine the contrast potential (based on M/C/Y/K-DMAX). | 0 ~ +2<br>Reference: 2 |

**Reference**

- If the value of 'M/C/Y/K-DMAX' is lower than 75, development with a value lower than 75 may be assumed to have a fault.
- If all value of 'M/C/Y/K-DMAX' are lower than 75, transfer/fixing may be assumed to have a fault.
- If the value of 'M/C/Y/K-DMAX' is 120 or higher and the copy has fogging, 'ATR' for the corresponding color may be suspected to have an error.

## 10. ADJ-MISC




| Item | Description | Remarks |
|---|---|---|
| VCONT | Switching between Auto and Manual for the Target Contrast Potential (VG, VDC)<br>0: auto (set by auto gradation correction control)<br>1–8: manual | 0 ~ 12<br><br>Use 1 through 8 for checks only; return it to '0' after each check.<br><br>'9' through '12' are for factory only. |
| SEG-ADJ<br><br>(See note) | Fine-Adjusting the Text/Photo Separation Level in Text/Photo Mode or Text/Print Paper Mode<br>+: tends to identify as photo<br>–: tends to identify as text<br>This mode is used to correct 'Text/Photo Adjustment' of user mode. | –3 ~ +3<br>reference: 0 |
| BC-ADJ<br><br>(See note) | Black Text Correction<br>A higher setting causes black text to be darker in 4-color text/photo mode. | –3 ~ +3<br>reference: 0 |
| LGCR-IPU | Set it to '1' if you want the gray balance of images from an external controller to be given priority. | reference: 0 |

| | M | C | Y | K |
|---|---|---|---|---|
| 1 | 320V | 315V | 315V | 330V |
| 2 | 317V | 312V | 312V | 328V |
| 3 | 310V | 305V | 305V | 321V |
| 4 | 295V | 290V | 290V | 308V |
| 5 | 275V | 270V | 270V | 290V |
| 6 | 270V | 270V | 270V | 270V |
| 7 | 270V | 270V | 270V | 270V |
| 8 | 270V | 270V | 270V | 270V |
| 9 | reserved | reserved | reserved | reserved |
| 10 | reserved | reserved | reserved | reserved |
| 11 | reserved | reserved | reserved | reserved |
| 12 | reserved | reserved | reserved | reserved |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.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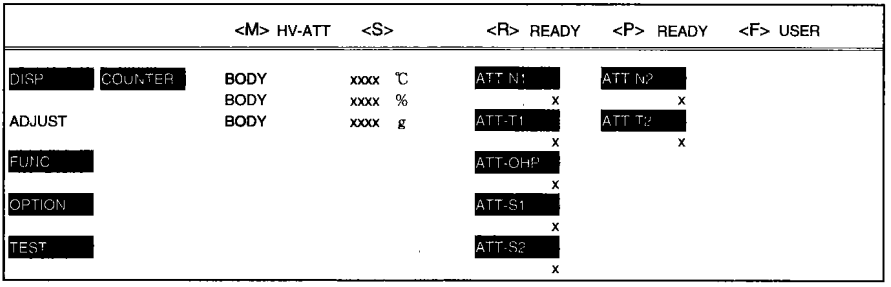
## 11. Fine-Adjusting the High-Voltage Output of Attraction by Condition




| Item | Description | Remarks |
|---|---|---|
| BODY (°C) | Indicates the machine internal temperature measured by the environment sensor. | Identical to the notation under 'DISPLAY→ANALOG'. |
| BODY (%) | Indicates the machine internal humidity measured by the environment sensor. | |
| BODY (g) | Indicates the machine internal absolute humidity (g) measured by the environment sensor. | |
| ATT-N1 (See note) | Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying, 'ATT-RTN' and SW1 or SW3 set to '1'. | Setting :–2 to +2<br>Unit :7.5 μA<br>Standard: 0 |
| ATT-N2 (See note) | Effective only when all the following conditions are true: 2nd side of two-sided copying, 'ATT-RTN' and SW2 or SW4 set to '1'. | |
| ATT-T1 (See note) | Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying. | |
| ATT-T2 (See note) | Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying. | |
| ATT-OHP (See note) | Effective in OHP mode. | |
| ATT-S1 (See note) | Effective in special paper 1 mode. | |
| ATT-S2 (See note) | Effective in special paper 2 mode. | |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Reference**

- This service mode is effective when attraction failure occurs or a transfer fault occurs in each mode.

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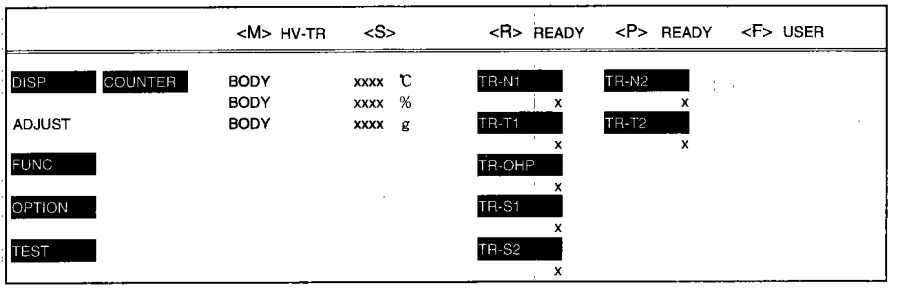
## 12. Fine-Adjusting the High-Voltage Output of Transfer by Condition




| Item | Description | Remarks |
|---|---|---|
| BODY (°C) | Indicates the machine internal temperature measured by the environment sensor. | Identical to the notation under 'DISPLAY→ANALOG'. |
| BODY (%) | Indicates the machine internal humidity measured by the environment sensor. | |
| BODY (g) | Indicates the machine internal absolute humidity (g) measured by the environment sensor. | |
| TR-N1 (See note) | Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying, 'ATT-RTN' and SW1 or SW3 set to '1'. | Setting : −4 to +4<br>Unit : 1.0 μA<br>Standard: 0 |
| TR-N2 (See note) | Effective for the 2nd side of two-sided copying. | |
| TR-T1 (See note) | Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying. | |
| TR-T2 (See note) | Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying. | |
| TR-OHP (See note) | Effective in OHP mode. | |
| TR-S1 (See note) | Effective in special paper 1 mode. | |
| TR-S2 (See note) | Effective in special paper 2 mode. | |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Reference**

- This service mode is effective when transfer failure occurs or a transfer fault occurs in each mode.

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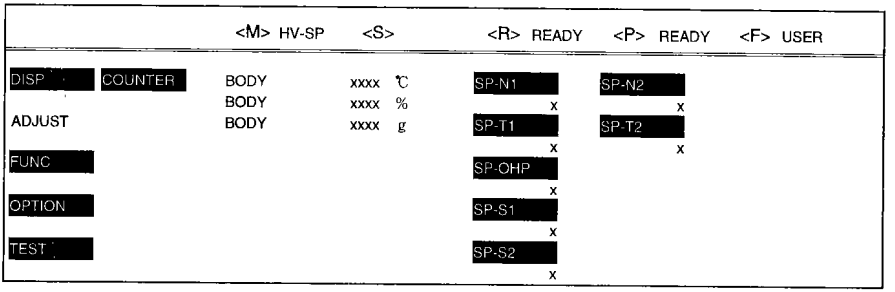
## 13. Fine-Adjusting the High-Voltage Output of Separation by Condition




| Item | Description | Remarks |
|---|---|---|
| BODY (°C) | Indicates the machine internal temperature measured by the environment sensor. | Identical to the notation under 'DISPLAY→ANALOG'. |
| BODY (%) | Indicates the machine internal humidity measured by the environment sensor. | |
| BODY (g) | Indicates the machine internal absolute humidity (g) measured by the environment sensor. | |
| SP-N1 (See note) | Effective only when all the following conditions are true: Plain paper mode, one-sided copying or 1st side of two-sided copying. | Setting: –5 to +5<br>Unit: 1.0 g/m³<br>Standard: –3<br>(0: SP-N2 only)<br>Changes the timing at which the separation high-voltage output turns off; see Reference b. |
| SP-N2 (See note) | Effective for the 2nd side of two-sided copying. | |
| SP-T1 (See note) | Effective only when all the following conditions are true: Thick paper mode, one-sided copying or 1st side of two-sided copying. | |
| SP-T2 (See note) | Effective only when all the following conditions are true: Thick paper mode, 2nd side of two-sided copying. | |
| SP-OHP (See note) | Effective in OHP mode. | |
| SP-S1 (See note) | Effective in special paper 1 mode. | |
| SP-S2 (See note) | Effective in special paper 2 mode. | |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

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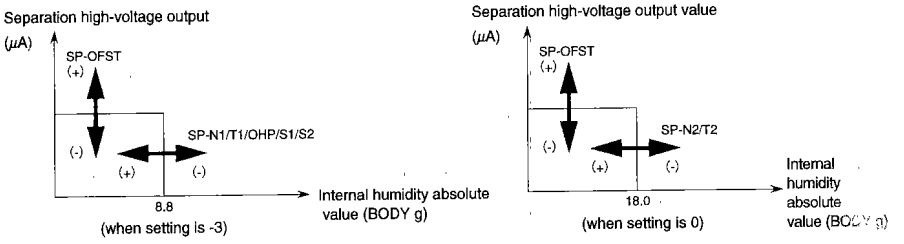
**Reference**

- This service mode is effective when transfer failure occurs or a transfer fault occurs in each mode. For details on how to use the mode, see the descriptions on troubleshooting image faults.
- The machine's high voltage for separation remains off in a high-humidity environment; the standard setting is the machine internal absolute humidity, i.e., 'BODY g=8.8g'.
  The output of the separation high voltage is turned on or off with reference to the data read by the environment sensor, i.e., machine internal absolute humidity, i.e., 'BODYg'. 'HV-SP' is used to change the slice level for turning the output on or off; further, the output may be adjusted by 'ADJUST→HV-OFST→SP-OFST'.

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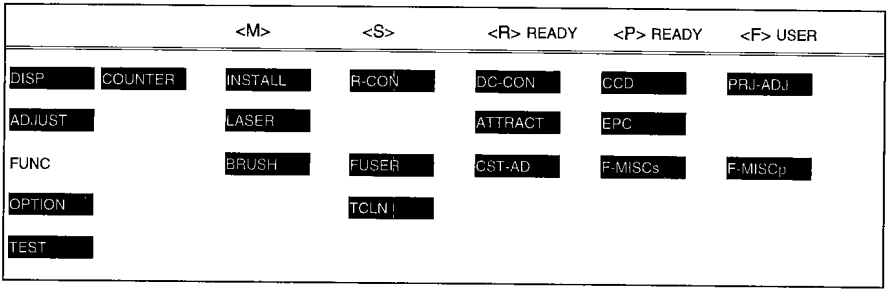
## D. Function Mode (FUNCTION)




| | | |
|---|---|---|
| 1 | INSTALL | Use it at time of installation. |
| 2 | R-CON | Use it for functions related to the reader controller PCB. |
| 3 | DC-CON | Use it for functions related to the DC controller PCB. |
| 4 | CCD | Use it for functions related to the CCD. |
| 5 | PRJ-ADJ | Use it for functions related to the projector. |
| 6 | LASER | Use it to functions related to the laser. |
| 7 | ATTRACT | Use it for functions related to the point of retention. |
| 8 | EPC | Use it for functions related to the measurement of the photosensitive drum potential. |
| 9 | BRUSH | Use it for functions related to the transfer/retention brush. |
| 10 | FUSER | Use it for functions related to the fixing assembly. |
| 11 | CST-AD | Use it for functions related to the cassette paper width. |
| 12 | F-MISCs | Use it for functions/inspections related to the reader unit. |
| 13 | F-MISCp | Use it for functions/inspections related to the printer unit. |
| 14 | TCLN | Use it to operate the polishing roller/oil removing roller. |

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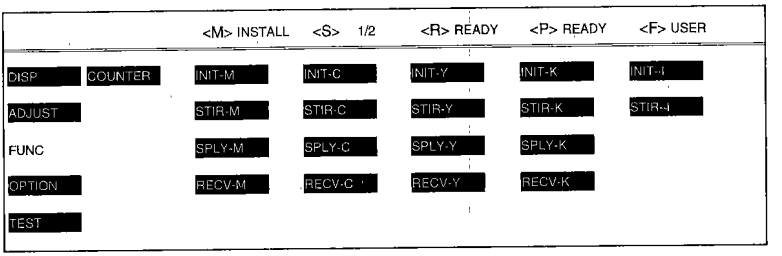
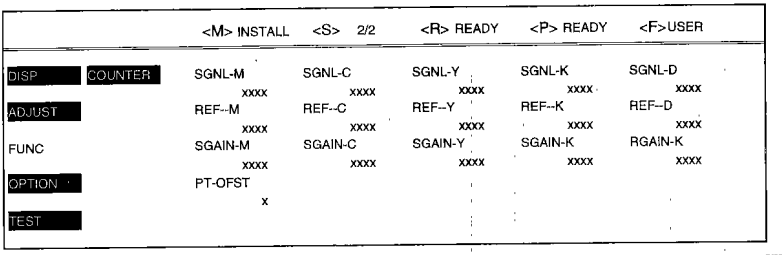
## 1. Installation




| Item | Description | Remarks |
|---|---|---|
| INIT-M<br>INIT-C<br>INIT-Y<br>INIT-K | Use it to specify the color for which the initial setting of the toner density signal (SGNL, REF) should be read.<br>• The setting will be indicated on the next screen; be sure to record it on the service label. | |
| INIT-4 | Use it to read the initial settings of the toner density signal (SGNL, REF) of the four colors in sequence.<br>• The setting will be indicated on the next screen; be sure to record it on the service label. | Make sure that the copier is in wait state (<P> in service mode is 'READY') before executing 'INIT-4' |
| STIR-M<br>STIR-C<br>STIR-Y<br>STIR-K | Use it to specify which developer (color) to be stirred. | |
| STIR-4 | Use it to stir the developers (4 colors) in sequence. | |
| SPLY-M<br>SPLY-C<br>SPLY-Y<br>SPLY-K | Use it to rotate the cylinder of the developer so that the developing assembly will be supplied with the developer of the color. | |
| PT-OFST | Indicates the correction value of the laser output for BK ATR control.<br>Is set automatically when 'INIT-K' or 'INIT-4' is executed. | Recorded the value on the Service Label after executing 'INIT-K' or 'INIT-4'. |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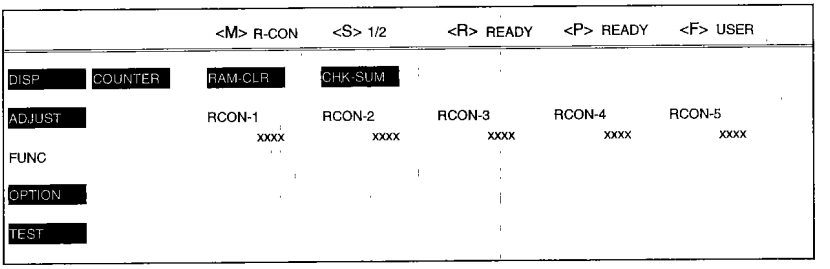
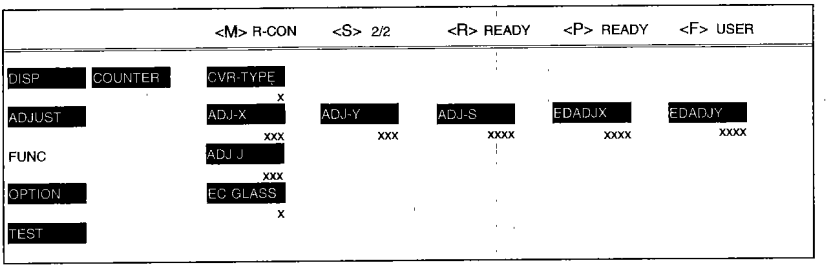
| Item | Description | Remarks |
|---|---|---|
| RECV-M<br>RECV-C<br>RECV-Y<br>RECV-K | Use it to rotate the cylinder of the developing assembly so that the developer of the specified color will be drawn out of the developing assembly.<br>• Place a plastic bag or the like under the developer before removing the cap from the developer supply mouth found at the bottom of the developing assembly.<br>**Caution:**<br>This is NOT a mode to be executed at the time of installation. | |
| SGNL-M<br>SGNL-C<br>SGNL-Y<br>SGNL-K | Indicates the value of the toner density signal effective when 'INIT' has been executed as ATR control.<br>Be sure to record in the label on the DC controller PCB; see Figure 3-1102. | SGNL-M/SGNL-C/SGNL-Y: normally, 818 ±41. |
| SGNL-D | Indicates the signal value of the black toner density sensor in relation to the reflected light of the photosensitive drum.<br>Be sure to record in the label on the DC controller PCB; see Figure 3-1102. | Normally, 614 ±21. |
| REF-M<br>REF-C<br>REF-Y<br>REF-K | Indicates the value of the toner density reference signal when 'INIT' has been executed as ATR control.<br>Be sure to record in the label on the DC controller PCB; see Figure 3-1102. | REF-K: Normally, 818 ±41. |
| REF-D | Indicates the reference signal value of the black toner density sensor in relation to the reflected light of the photosensitive drum. | |
| SGAIN-M<br>SGAIN-C<br>SGAIN-Y<br>SGAIN-K | Indicates the value of the gain for the toner density signal at time of ATR control (gain used for setting SGNL-M/SGNL-C/SGNL-Y to '818' and SGNL-D to '614').<br>Be sure to record in the label on the DC controller PCB; see Figure 3-1102. | |
| RGAIN-K | Indicates the value of the gain for toner density reference signal at time of ATR control (gain used for setting REF-K to '818').<br>Be sure to record in the label on the DC controller PCB; see Figure 3-1102. | |

**Caution:**
You must make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing any mode.

## 2. Functions Related to the Reader Controller PCB




### Entering Back up Data

You must enter the data recorded on the label (Figure 3-1102) using the screen whenever you have replaced the reader controller PCB.

| Item | Description | Remarks |
|---|---|---|
| RAM-CLR | Use it to clear the RAM on the reader controller PCB and to set the standard settings. | |
| CHK-SUM | Use it to start checking the ROM on the reader controller PCB. (by totaling the RAM data). | |
| RCON-1 | Indicates the check sum value of Q605 on the reader controller PCB. | |
| RCON-2 | Indicates the check sum value of Q616 on the reader controller PCB. | |
| RCON-3 | Indicates the check sum value of Q617 on the reader controller PCB. | |
| RCON-4 | Indicates the check sum value of Q901 on the reader controller PCB. | |
| RCON-5 | Not used. | |
| CVR-TYPE | Use it to enter the version of CVR.<br>0: old type<br>1: new type | |
| ADJ-X | Use it to enter the adjustment value of the image read start position in the sub scanning direction. | |
| ADJ-Y | Use it to enter the adjustment value of the image read start position in the main scanning direction. | |

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| Item | Description | Remarks |
|---|---|---|
| ADJ-S | Use it to enter the adjustment value of the point of shading. | |
| EDADJX | Use it to enter the adjustment value of the specified position in the sub scanning direction of the editor. | |
| EDADJY | Use it to enter the adjustment value of the specified position in the main scanning direction of the editor. | |
| ADJ-J | Enter the auxiliary rotation time for the scanner motor. | |
| EC-GLASS | Set it to '1' if EC-coated glass is used. | The initial setting at time of executing 'RAM-CLR' is '1' for the 115/230V model. |

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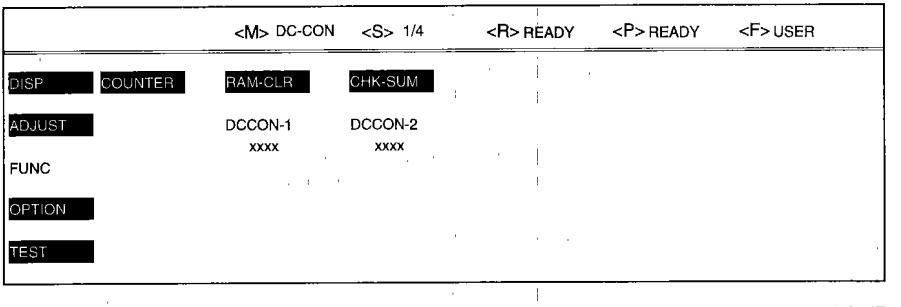
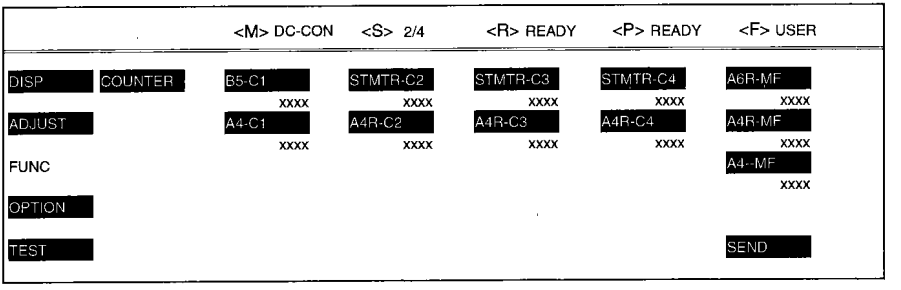
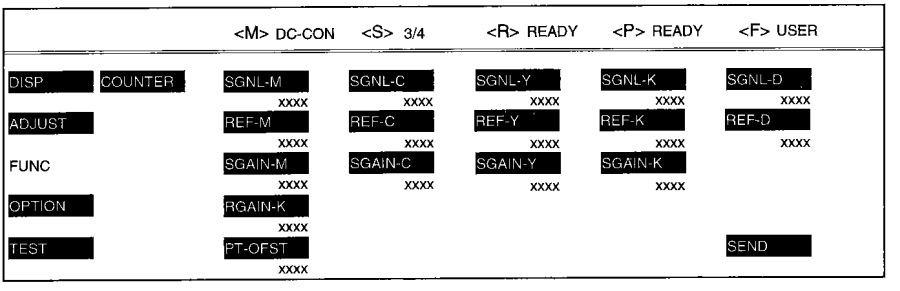
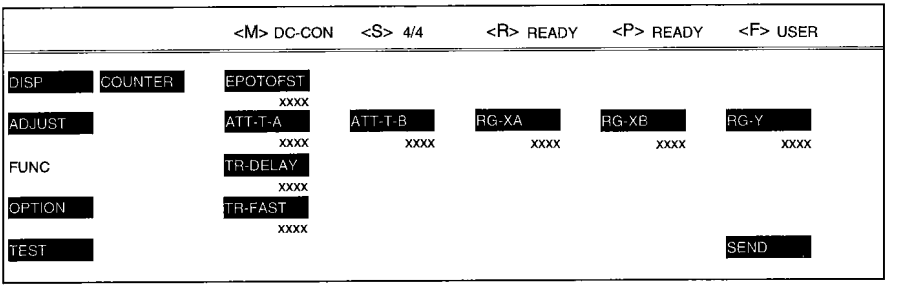
## 3. Functions Related to the DC Controller PCB

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## Entering Backup Data

You must enter the data recorded on the label shown in Figure 3-1102 using this screen whenever you have replaced the DC controller PCB.

| Item | Description | Remarks |
|---|---|---|
| RAM-CLR | Use it to clear RAM on the DC controller PCB and to set the standard settings. | |
| CHK-SUM | Use it to start checking the ROM on the DC controller PCB (by totaling the RAM data). | |
| DCCON-1 | Indicates the check sum value of IC104 on the DC controller PCB. | |
| DCCON-2 | Not used. | |
| B5-C1 | Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 1. | |
| A4-C1 | Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 1. | |
| STMTR-C2 | Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 2. | If CLC800, no indication. |
| A4R-C2 | Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 2. | |
| STMTR-C3 | Use it to enter the adjustment value of the paper width detection reference point for the cassette 3. | If CLC700, no indication. |
| A4R-C3 | Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 3. | |
| STMTR-C4 | Use it to enter the adjustment value of the paper width detection reference point 1 for the cassette 4. | If CLC700, no indication. |
| A4R-C4 | Use it to enter the adjustment value of the paper width detection reference point 2 for the cassette 4. | |
| A6R-MF | Use it to enter the adjustment value of the paper width reference point 1 for the multifeeder. | |
| A4R-MF | Use it to enter the adjustment value of the paper width detection reference point 2 for the multifeeder. | |
| A4-MF | Use it to enter the adjustment value of the paper width detection reference value 3 fort the multifeeder. | |
| SEND | Use it to transfer the image data of the screen on display to the reader controller. | |
| SGNL-M<br>SGNL-C<br>SGNL-Y<br>SGNL-K | Use it to enter the toner density signal. | |
| SGNL-D | Use it to enter the value of the toner density signal at time of correction for the window soiling. | |

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| Item | Description | Remarks |
|---|---|---|
| REF-M<br>REF-C<br>REF-Y<br>REF-K | Use it to enter the value of the toner density reference signal. | |
| REF-D | Use it to enter the value of the toner density reference signal at time of correction for the window soiling. | |
| SGAIN-M<br>SGAIN-C<br>SGAIN-Y<br>SGAIN-K | Use it to enter the gain for the toner density signal at time of toner density control. | |
| RGAIN-K | Use it to enter the value of the gain for the toner density reference signal at time of toner density control. | |
| PT-OFST | Enter the correction value for the laser output for BK ATR. | |
| SEND | Use it to transfer the data of the screen on display to the DC controller PCB.<br>When service mode is ended, the copy that follows will reflect the transferred data. | |
| EPOTOFST | Use it to enter the potential offset value. | |
| ATT-T-A | Use it to enter the adjustment value of the side A retention timing for the transfer drum. | |
| ATT-T-B | Use it to enter the adjustment value of the side B retention timing for the transfer drum. | |
| RG-XA | Use it to enter the registration adjustment value of the side A sub scanning direction (paper feeding direction) for the transfer drum. | |
| RG-XB | Use it to enter the registration adjustment value of the side B sub scanning direction (paper feeding direction) for the transfer drum. | |
| RG-Y | Use it to enter the registration adjustment value of the main scanning direction (drum axial direction) for the transfer drum. | |
| TR-DELAY | Use it to enter the adjustment value of the point of transfer. | |
| TR-FAST | Enter the value used when changing the trailing edge margin. | -127~127<br>Unit: 0.1mm<br>See "Changing the Image Trailing Edge Margin." |
| SEND | Use it to transfer the data of the screen on display to the reader controller PCB.<br>When service mode is ended, the copy that follows will reflect the transferred data. | |

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## 4. Making CCD-Related Adjustments

| | <M> CCD | <S> 1/2 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|
| DISP COUNTER | AUTO-ADJ | | | AP-TYPE | |
| | | | | x | |
| ADJUST | OD-OFST | BLUE | GREEN | RED | |
| | | xxx | xxx | xxx | |
| FUNC | EV-OFST | BLUE | GREEN | RED | CVR-TYPE |
| | | xxx | xxx | xxx | x |
| OPTION | LAMP | DATA | | | CCD-MODE |
| | | xxx | | | x |
| TEST | GAIN | BLUE | GREEN | RED | CCD-DISP |
| | | xxx | xxx | xxx | x |

| | <M> CCD | <S> 1/2 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|
| DISP COUNTER | AUTO-ADJ | | | AP-TYPE | |
| | | | | x | |
| ADJUST | OFFST | BLUE | GREEN | RED | |
| | | xxx | xxx | xxx | |
| FUNC | BALANCE | BLUE | GREEN | RED | CVR-TYPE |
| | | xxx | xxx | xxx | x |
| OPTION | LAMP | DATA | | | CCD-MODE |
| | | xxx | | | x |
| TEST | GAIN | BLUE | GREEN | RED | CCD-DISP |
| | | xxx | xxx | xxx | x |

| | <M> CCD | <S> 2/2 | <R> READY | <P> READY | <F> USER |
|---|---|---|---|---|---|
| DISP COUNTER | TARGET | BLUE | GREEN | RED | |
| | | xxx | xxx | xxx | |
| ADJUST | | | | | |
| FUNC | GAIN-UP | BLUE | GREEN | RED | |
| | | xxx | xxx | xxx | |
| OPTION | | | | | |
| TEST | | | | | |

| Item | Description | Remarks |
|---|---|---|
| AUTO-ADJ | Use it to start automatic adjustment.<br>The bar code data on the standard white plate is read and offset-adjustment, scanning lamp intensity adjustment, and gain adjustment are executed in sequence. | Adjustments are made so that the value of point A is the setting obtained from the bar code data. |
| AP-TYPE | Use it to indicate the version of the analog processor PCB.<br>0: old type<br>1: new type | |

| Item | | Description | Remarks |
|---|---|---|---|
| OD-OFST | | Use it to indicate the value of the offset level for the odd bits of the CCD. | Be sure to copy the values on the service label attached to the cover of the DC controller PCB. |
| | BLUE | Use it to indicate the data of BLUE for the offset level. | |
| | GREEN | Use it to indicate the data for GREEN for the offset level. | |
| | RED | Use it to indicate the data for RED for the offset level. | |
| EV-OFST (AP-TYPE=0) | | Use it to indicate the value of the offset level for the even bits of the CCD. | |
| | BLUE | Use it to indicate the data for BLUE for the offset level. | |
| | GREEN | Use it to indicate the data for GREEN for the offset level. | |
| | RED | Use it to indicate the data for RED for the offset level. | |
| LAMP | | Use it to indicate the level adjustment value for the scanning lamp. | |
| DATA | | Use it to indicate the level data for the scanning lamp. | |
| OFFSET (AP-TYPE=1) | | Use it to indicate the offset level adjustment value for the odd bits of the CCD. | |
| | BLUE | Use it to indicate the data for BLUE for the offset level. | |
| | GREEN | Use it to indicate the data for GREEN for the offset level. | |
| | RED | Use it to indicate the data for RED for the offset level. | |
| BALANCE (AP-TYPE=1) | | Use it to indicate the balance level adjustment value for the even bits and the odd bits of the CCD. | |
| | BLUE | Use it to indicate the data for BLUE for the balance level. | |
| | GREEN | Use it to indicate the data for GREEN for the balance level. | |
| | RED | Use it to indicate the data for RED for the balance level. | |

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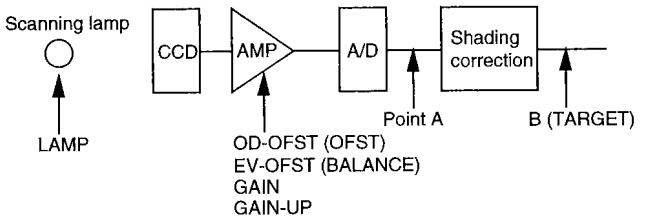
| Item | | Description | Remarks |
|---|---|---|---|
| GAIN | | Use it to indicate the gain level adjustment value for the CCD. | |
| | BLUE | Use it to indicate the data for BLUE for the gain level. | |
| | GREEN | Use it to indicate the data for the GREEN for the gain level. | |
| | RED | Use it to indicate the data for the RED for the gain level. | |
| TARGET | | Use it to indicate the shading adjustment correction value (target value for pint B). | Be sure to record the values on the service level attached to the cover of the DC controller PCB. |
| | BLUE | Use it to indicate the data for BLUE. | |
| | GREEN | Use it to indicate the data for GREEN. | |
| | RED | Use it to indicate the data for RED. | |
| CVR-TYPE (See note) | | Use it to enter the version of the CVR.<br>0: old type<br>1: new type | |
| CCD-MODE | | Use it to check the result of 'AUTO-ADJ', i.e., normal or precious metal mode. | 0: normal<br>1: precious metal |
| CCD-DISP | | Use it to switch the data display of the CCD screen. | 0: normal<br>1: precious metal |
| GAIN-UP | | Use it to check which mode is effective, i.e., gain-up or normal.<br>gain up: 255<br>normal: 0 | In gain-up mode, the gain will be double that of normal mode. |
| | BLUE | Use it to indicate the data for BLUE. | |
| | GREEN | Use it to indicate the data for GREEN. | |
| | RED | Use it to indicate the data for RED. | |

**Note 1:**

The value of the item returns to its standard value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

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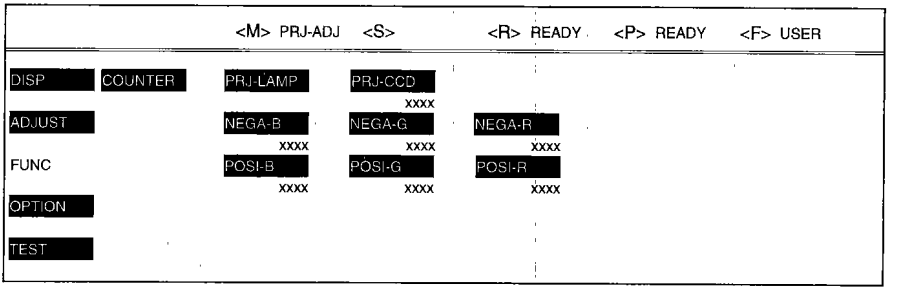
## 5. Adjusting the Projector




| Item | Description | Settings |
|---|---|---|
| PRJ-LAMP | Use it to keep the lamp of the film projector on for 1 min.<br>(Press 'PRJ-LAMP' to turn it off.) | |
| PRJ-CCD | Use it to adjust the gain of the CCD at time of installation and to read data. | |
| NEGA-B<br>NEGA-G<br>NEGA-R<br>(See note) | Use it to adjust the target value for shading correction when copying negative film using the film projector.<br>• A higher setting increases the density<br>B → Y<br>G → M<br>R → C | –100 ~ +100 |
| POSI-B<br>POSI-G<br>POSI-R | Use it to adjust the target value for shading correction used when making positive film with the film projector in use.<br>• A lower setting for the following darkens the images:<br>B → Y<br>G → M<br>R → C | –100 ~ +100 |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.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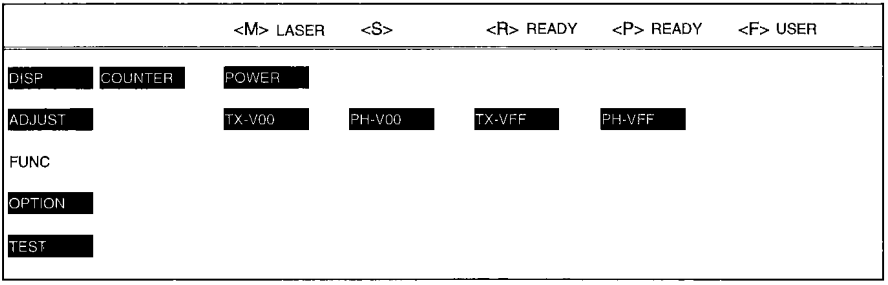
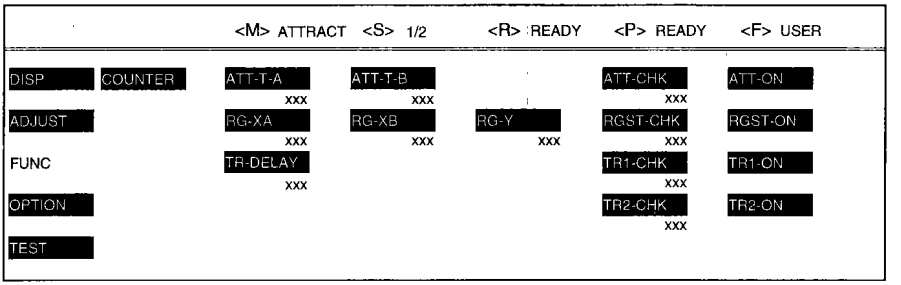
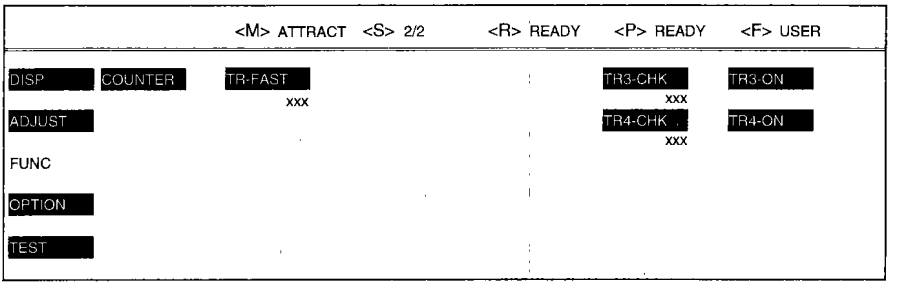
## 6. Adjusting the Laser




| Item | Description | Remarks |
|---|---|---|
| POWER | Use it to turn on the laser output for adjusting the laser power. | Press 'STOP' to turn it off. |
| TX-V00 | Use it to turn on the laser output for V00 to check V00 for text mode. | |
| PH-V00 | Use it to turn on the laser output for V00 to check V00 for photo mode. | |
| TX-VFF | Use it to check the laser output for V00 to check VFF for text mode. | |
| PH-VFF | Use it to turn on the laser output to for V00 to check VFF in photo mode. | |

## 7. Adjusting the Point of Retention




| Item | Description | Remarks |
|---|---|---|
| ATT-T-A | Use it to enter the timing of retention of copy paper to side A of the transfer drum. | Unit: 0.1 mm |
| ATT-T-B | Use it to enter the timing of retention of copy paper to side B of the transfer drum. | Unit: 0.1 mm |
| ATT-CHK | Use it to specify the point of retention on the transfer drum.<br>1: Double-side retention (side B, side A)<br>2: Side A retention<br>3: Side B retention | |
| ATT-ON | Use it to execute retention of copy paper to the transfer drum.<br>Attracts copy paper to the transfer drum.<br>The paper is picked up from cassette 1; therefore, 'NO PAPER' will appear under <P> on the display if cassette 1 is out of paper; the notation returns to 'READY' when paper has been supplied. | |
| RG-XA | Use it to enter the fine-adjustment value of the point of retention in X direction (paper feeding direction) on side A of the transfer drum. | Unit: 0.1 mm |
| RG-XB | Use it to enter the fine-adjustment value of the point of retention in X direction (paper feeding direction) on side B of the transfer drum. | Unit: 0.1 mm |

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| Item | Description | Remarks |
|---|---|---|
| RG-Y | Use it to enter the fine-adjustment value of the point of retention in the Y direction (drum axial direction) of the transfer drum. | |
| RGST-CHK | Use it to specify the mode for 'RGST-ON' operation.<br>1: Double-sided retention (side B, side A)<br>2: Side A retention<br>3: Side B retention | |
| RGST-ON | Use it to generate a cyan mono print.<br>The side (A or B) will be indicated on the print face. | |
| TR-DELAY | Use it to enter the fine-adjustment value of the point of transfer. | |
| TR1-CHK | Use it to specify the mode for 'TR1-ON' operation.<br>1: Double-side retention (side B, side A)<br>2: Side A retention<br>3: Side B retention | |
| TR1-ON | Use it to adjust to a leading margin of 1 mm; see Figure 2-16 in Service Handbook for an output sample. | |
| TR2-CHK | Use it to specify the mode for 'TR2-ON' operation.<br>1: Double-side retention<br>2: Side A retention<br>3: Side B retention | |
| TR2-ON | Use it to check the leading edge margin (8 mm); see Figure 2-16 in Service Handbook for an output print. | |
| TR-FAST | Use it to set the appropriate transfer high-voltage trailing edge control value to accommodate a trailing edge margin of 2.5 mm. | See "Changing the Image Trailing Edge Margin." |
| TR3-CHK | Use it to select the appropriate mode for 'TR3-ON'.<br>1: 2-sheet retention (side B, side A)<br>2: side A retention<br>3: side B retention | |
| TR3-ON | Use it to generate a test print for checking the TR-FAST adjustment value. | |
| TR4-CHK | Use it to select the appropriate mode for 'TR4-ON'.<br>1: 2-sheet retention (side B, side A)<br>2: side A retention<br>3: side B retention | |
| TR4-ON | Use it to generate a test print for checking the trailing edge of 2.5 mm. | |

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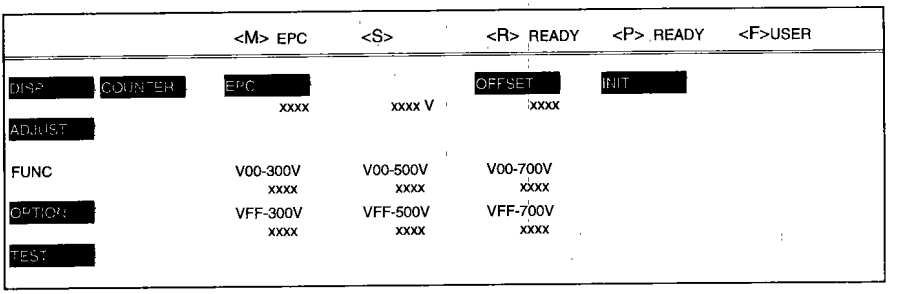
## 8. Measuring the Photosensitive Drum Potential




| Item | Description | Remarks |
|---|---|---|
| EPC | Use it to measure the photosensitive drum potential. | The potential measurement data will be used for the next copying operation. |
| OFFSET | Use it to execute offset adjustment for the potential measuring PCB of the photosensitive drum. | The potential measurement data will be used for the next copying operation. |
| INIT | Use it to initialize the potential measurement data for the photosensitive drum. | Be sure to set 'PASCAL' under 'ADJUST to '0' when executing this mode. |
| V00-300V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 300 V and the laser output is V00. | guide: 280 ~ 380 |
| V00-500V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 500 V and the laser output is V00. | guide: 480 ~ 620 |
| V00-700V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 700 V and the laser output is V00. | guide: 680 ~ 860 |
| VFF-300V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 300 V and the laser output is VFF. | guide: 35 ~ 145 |
| VFF-500V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 500 V and the laser output is VFF. | guide: 40 ~ 190 |
| VFF-700V | Indicates the photosensitive drum surface potential when the grid bias potential of the primary corona assembly is 700 V and the laser output is VFF. | guide: 45 ~ 235 |

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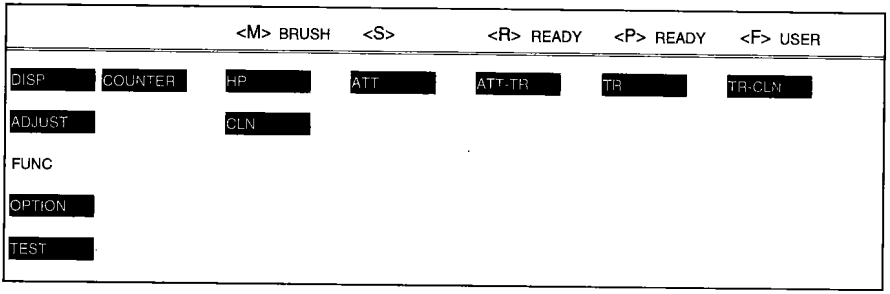
## 9. Transfer/Retention Brush Functions




| Item | Description | Remarks |
|---|---|---|
| HP | Use it to rotate the brush drive motor, thereby causing a move to the home position. | |
| ATT | Use it to rotate the brush drive motor, thereby causing a move to the point of retention (retention brush engagement position). | |
| ATT-TR | Use it to rotate the brush drive motor, thereby causing a move to the point of retention/transfer (retention brush and transfer brush). | |
| TR | Use it to rotate the brush drive motor, thereby causing a move to the point of transfer (transfer brush engagement position). | |
| TR-CLN | Use it to rotate the brush drive motor, thereby causing a move to the point of transfer/transfer cleaning, i.e., transfer brush and cleaning push-on brush engagement position. | |
| CLN | Use it to rotate the brush drive motor, thereby causing a move to the point of transfer cleaning (cleaning push-on brush engagement position). | |

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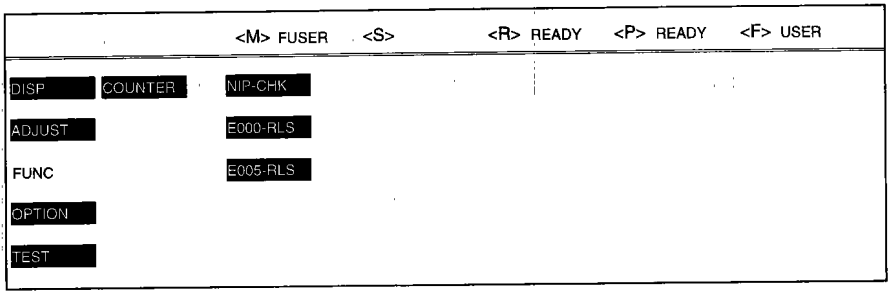
## 10. Functions Related to the Fixing Assembly




| Item | Description | Remarks |
|---|---|---|
| NIP-CHK | Measuring the Fixing Nip<br>Stops copy paper at a specific point and discharges it.<br>The paper is picked up from cassette 1; therefore, 'NO PAPER' will appear under <P> on the display if cassette 1 is out of paper; the notation returns to 'READY' when paper has been supplied. | Press 'NIP-CHK' to execute.<br><P> changes from 'READY' to 'SERVICE and then to 'READY'. |
| E000-RLS | Clearing E000<br>Be sure to turn the power switch off and then on after execution. | The indication for <P> changes from 'ERROR' to 'SERVICE' and then to 'ERROR'.<br>Turn off and then on the power switch to clear. |
| E005-RLS | Clearing E005<br>Be sure to turn off and on the power switch after execution. | |

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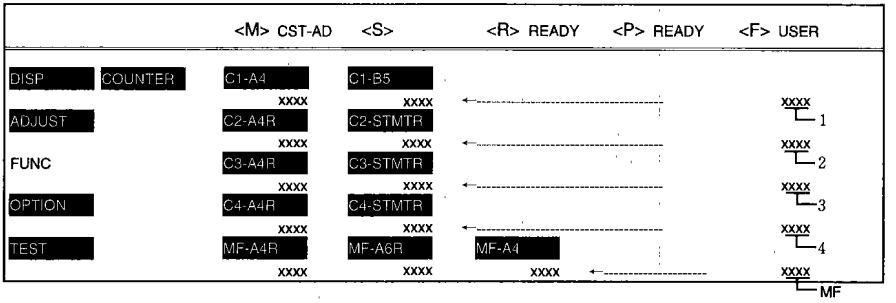
## 11. Adjusting the Cassette Paper Width




See the descriptions in "5. Storing the Cassette/Multifeeder Basic Settings" under "B. Electrical" of "II. Standards and Adjustments."

| Item | Description | Remarks |
|---|---|---|
| C1-A4 | Use it to execute automatic adjustment of the paper width reference 2 of the cassette 1. | |
| C1-B5 | Use it to execute automatic adjustment of the paper width reference 1 of the cassette 1. | |
| C2-A4R | Use it to execute automatic adjustment of the paper width reference 2 of the cassette 2. | If CLC800, no indication. |
| C2-STMTR | Use it to execute automatic adjustment of the paper width reference 1 of the cassette 2. | |
| C3-A4R | Use it to execute automatic adjustment of the paper width reference 2 of the cassette 3. | If CLC700, no indication. |
| C3-STMTR | Use it to execute automatic adjustment of the paper width reference 1 of the cassette 3. | |
| C4-A4R | Use it to execute automatic adjustment of the paper width reference 2 of the cassette 4. | If CLC700, no indication. |
| C4-STMTR | Use it to execute automatic adjustment of the paper width reference 1 of the cassette 4. | |
| MF-A4R | Use it to execute automatic adjustment of the paper width reference 2 of the multifeeder. | |
| MF-A6R | Use it to execute automatic adjustment of the paper width reference 1 of the multifeeder. | |
| MF-A4 | Use it to execute automatic adjustment of the paper width reference 3 of the multifeeder. | |

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| Item | Description | Remarks |
|---|---|---|
| xxxx .....1 | Indicates the AD conversion value of the paper width detection reference point of the cassette 1. | |
| xxxx .....2 | Indicates the AD conversion value of the paper width detection reference point of the cassette 2. | If CLC800, no indication. |
| xxxx .....3 | Indicates the AD conversion value of the paper width detection reference point of the cassette 3. | If CLC700, no indication |
| xxxx .....4 | Indicates the AD conversion value of the paper width detection reference point of the cassette 4. | |
| xxxx .....MF | Indicates the AD conversion value of the paper width detection reference of the multifeeder. | |

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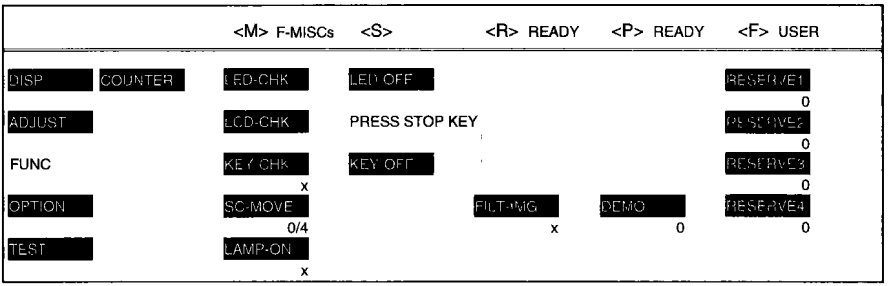
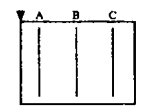
## 12. Functions/Inspections Related to the Reader Unit




| Item | Description | Remarks |
|---|---|---|
| LED-CHK | Use it to start checking LED activation. | |
| LED-OFF | Use it to end checking LED activation. | |
| LCD-CHK | Use it to start LCD activation.<br>(Highlights the key.) | To end checking, press the Stop key. |
| KEY-CHK | Use it to start checking the KEY input.<br>(See descriptions on 'KEY-CHK'.) | Indicates the number/ name of the input key. |
| KEY-OFF | Use it to end checking the KEY input. | |
| SC-MOVE | Starts checking the scanner. Each press on 'SC-MOV' causes the following indications and operations:<br>Indication / Operation<br>0/4 — HP → A<br>1/4 — HP → B<br>2/4 — HP → C<br>3/4 — HP |  |
| FILT-IMG | Use it to check the output of each CCD (RGB). Place a color original on the copyboard glass, and press the Copy Start key; the output of each CCD (RGB) is printed on separate sheets in cyan mono.<br>After making copies, the execution ends automatically. | Each press on the key changes the intensity data to '00' and '80'. |

<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>LAMP-ON</td><td>Starts checking the scanning lamp. Each press on 'LAMP-ON' causes the following indications and operations:<br><table><tr><th>Indication</th><th>Operation</th></tr><tr><td>0 → 1<br>1 → 0</td><td>Turns on at intensity data 80 (light)<br>Turns on at intensity data 00 (dark)</td></tr></table></td><td>Each press on the key changes the intensity data to '00' and '80'.</td></tr>
<tr><td>DEMO</td><td>For R&D (not used)</td><td></td></tr>
<tr><td>RESERVE 1~4</td><td>For R&D (not used)</td><td></td></tr>
</table>

<Details of 'KEY-CHK'.>

| Key | Key name |
|---|---|
| 0 through 9 | 0 ~ 9 |
| Reset | RESET |
| Stop | STOP |
| Two-Sided | A |
| One-Touch Adjust | B |
| Color Adjust | C |
| Extended Zoom | D |
| Frame Erase | E |
| Color Create | F |
| Page Separate | G |
| Image Create | I |
| Marker | J |
| Synthesis | L |
| User Mode | M |
| OHP Interleaf | O |
| Start | START |
| Pre-Heat | STAND BY |
| Interrupt | INTERRUPT |
| Cover | N |
| Area Specify | K |
| Shift | H |
| Start | START |
| Clear | CLEAR |
| ID | ID |
| Call | CALL |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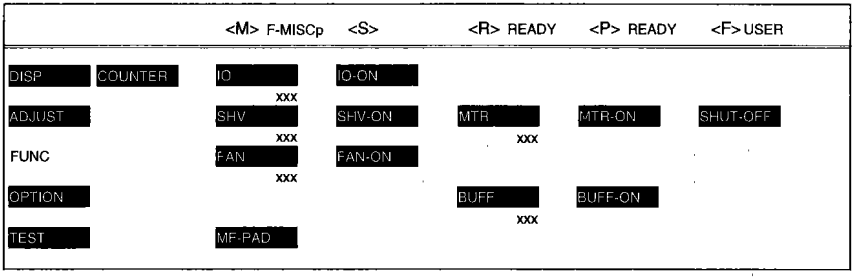
## 13. Functions/Inspection Related to the Printer Unit




| Item | Description | Remarks |
|---|---|---|
| IO | Use it to specify the type of I/O check. | See details. |
| IO-ON | Use it to start check on the I/O. | During operation, <P> SERVICE. |
| SHV | Use it to specify the type of check on the high-voltage output. | 0 through 6<br>See the table on next page. |
| SHV-ON | Use it to start checks on the high-voltage output. | During operation, <P> SERVICE. |
| MTR | Use it to specify the type of checks on the motor. | 00 through 18<br>See the table on next page. |
| MRT-ON | Use it to start checks on the motor. | During operation, <P> SERVICE. |
| SHUT-OFF | Executes an operation check for auto power-off. | During operation, <P> SERVICE. |
| FAN | Use it to specify the type of check on the fan. | 00 through 19<br>See the table on next page. |
| FAN-ON | Use it to start checks on the fan. | During operation, <P> SERVICE. |
| BUFF | Use it to specify a stop position (length of advancement) for the pressure cam inside the buffer path.<br>1: 0 mm<br>2: 0.7 mm<br>3: 1.2 mm<br>Enter a number using the keypad, and press the OK key to register. | |
| BUFF-ON | Use it to drive the buffer pass motor and the solenoid, thereby moving the cam to the specified position in 'BUFF'.<br>After checking the operation, be sure to set 'BUFF' to '1' and execute 'BUFF-ON'. | After setting 'BUFF' to '1', be sure to turn off and then on the power. |
| MF-PAD | Executes aging for the manual feed pad of the multifeeder; i.e., rotates the multifeeder roller. | During operation, <P> SERVICE. |

**Reference**

- You must execute 'MF-PAD' whenever you have replaced the manual feed pad of the multifeeder assembly.

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• Details of IO

| No | | No | |
|---|---|---|---|
| 40 | oil removing roller solenoid (SL11) | 75 | developing M cylinder clutch (CL1) |
| 42 | decurling sheet solenoid (SL28) | 76 | Bk toner supply clutch (CL8) |
| 43 | fixing cleaning belt take-up solenoid (SL6) | 77 | Y toner supply clutch (CL7) |
| 44 | fixing cleaning belt releaisng solenoid (SL5) | 78 | C toner supply clutch (CL6) |
| 45 | delivery paper deflecting plate drive solenoid (SL20) | 79 | M toner supply clutch (CL5) |
| 46 | separation claw drive solenoid (SL8) | 116 | delivery vertical path roller 2 drive clutch (CL23) |
| 48 | duplexing pick-up assembly stopper plate solenoid (upper; SL27) | 118 | multifeeder pick-up solenoid (SL15) |
| 49 | duplexing pick-up assembly stopper plate solenoid (lower; SL27) | 129 | buffer solenoid 1 |
| 50 | duplexing drive cluth (CL22) | 130 | buffer clutch 1 |
| 51 | duplexing feeding roller solenoid (SL22) | 133 | pre-exposure lamp (LA2) |
| 52 | L paper deflecting plate drive solenoid (SL23) | 144 | transfer drum cleaner solenoid (SL14) |
| 53 | M paper deflecting plate drive solenoid (SL24) | 147 | registration roller releasing solenoid (SL9) |
| 54 | S paper deflecting plate drive solenoid (SL25) | 148 | registration roller drive clutch (CL9) |
| 55 | SS paper deflecting drive solenoid (SL26) | 149 | retention guide drive solenoid (SL10) |
| 60 | pre-registration roller 1 drive clutch (CL10) | 150 | transfer drum drive solenoid (SL13) |
| 61 | pre-registration roller 2 drive clutch (CL11) | 155 | duplexing pick-up assembly pick-up solenoid (SL21) |
| 62 | pick-up vertical path roller 1 clutch (CLC800; CL20) | 156 | cassette 4 pick-up solenoid (SL19) |
| 63 | pick-up vertical path roller 3 clutch (CL18) | 157 | cassette 3 pick-up solenoid (SL18) |
| 64 | pick-up vertical path roller 2 clutch (CL21) | 158 | cassette 2 pick-up solenoid (SL17) |
| 65 | pick-up vertical path roller 1 clutch (CLC700; CL15) | 159 | cassette 1 pick-up solenoid (SL16) |
| 66 | multifeeder pick-up clutch (CL12) | 167 | separation spacer push-up solenoid (SL7) |
| 67 | duplexing pick-up clutch (CL19) | | |
| 68 | cassette 4 pick-up clutch (CL17) | | |
| 69 | cassette 3 pick-up clutch (CL16) | | |
| 70 | cassette 2 pick-up clutch (CL14) | | |
| 71 | cassette 1 pick-up clutch (CL13) | | |
| 72 | developing Bk cylinder clutch (CL4) | | |
| 73 | developing Y cylinder clutch (CL3) | | |
| 74 | developing C cylinder clutch (CL2) | | |

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## SHV in Detail

| Type number | High-voltage | Description |
|---|---|---|
| 0 | — | High-voltage output absent. |
| 1 | Primary corona assembly, grid output | Photosensitive drum motor: on<br>Pre-exposure: on<br>Photosensitive drum: 1 rotation<br>Primary output/grid output (550V): on<br>(wait for stop, 10 rotations of photosensitive drum)<br>Primary output/grid output (500V): off<br>Photosensitive drum: 1 rotation<br>Pre-exposure: off<br>Photosensitive drum motor: off |
| 2 | Primary corona assembly, grid output, retention, transfer, internal static eliminator output, external static eliminator output | Photosensitive drum motor: on<br>Pre-exposure lamp: on<br>Photosensitive drum: 1 rotation<br>Primary corona assembly/grid output (500V): on<br>Transfer drum: engaged<br>Internal/External static eliminator output: on<br>Retention/transfer corona output: on<br>(wait for stop, 10 rotations of photosensitive drum)<br>Retention/corona output: off<br>Internal/external static eliminator output: off<br>Thereafter, power-on sequence is executed.<br>(multiple initial rotation, transfer drum/static eliminator sequence) |
| 3 | Primary corona assembly, grid output, M developing assembly output | Photosensitive drum: on<br>Pre-exposure lamp: on<br>Photosensitive drum: 1 rotation<br>Primary corona assembly/grid output (500V): on<br>M developing assembly: AC/DC on<br>(wait for stop, 10 rotations of photosensitive drum)<br>M developing assembly: disengaged (AC/DC off)<br>Primary corona assembly output/grid output (500V): off<br>Photosensitive drum: 1 rotation<br>Pre-exposure: off<br>Photosensitive drum motor: off |

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| Type number | High-voltage | Description |
|---|---|---|
| 4 | Primary corona assembly, grid output, C developing assembly output | Photosensitive drum motor: on<br>Pre-exposure: on<br>Photosensitive drum: 1 rotation<br>Primary corona assembly/grid output (500V): on<br>M developing assembly: engaged (AC/DC on)<br>(wait for stop, 10 rotations of photosensitive drum)<br>M developing assembly: disengaged (AC/DC off)<br>Primary corona assembly/grid bias (500V): off<br>Photosensitive drum: 1 rotation<br>Pre-exposure: off<br>Photosensitive drum motor: off |
| 5 | Primary corona assembly, grid output, Y developing assembly output | Photosensitive drum motor: on<br>Pre-exposure: on<br>Photosensitive drum: 1 rotation<br>Primary corona assembly output/grid output (500V): on<br>Y developing assembly: engaged (AC/DC on)<br>(wait for stop, 10 rotations of photosensitive drum)<br>Y developing assembly: disengaged (AC/DC off)<br>Primary corona assembly output/grid output (500V): off<br>Photosensitive drum: 1 rotation<br>Pre-exposure: off<br>Photosensitive drum motor: off |
| 6 | Primary corona assembly, grid output, K developing assembly output | Photosensitive drum motor: on<br>Pre-exposure: on<br>Photosensitive drum: 1 rotation<br>Primary output/grid output (500V): on<br>K developing assembly: engaged (AC/DC on)<br>(wait for stop, 10 rotations of photosensitive drum)<br>K developing assembly: disengaged (AC/DC off)<br>Primary corona assembly output, grid output (500V): off<br>Photosensitive drum: 1 rotation<br>Pre-exposure: off<br>Photosensitive drum motor: off |

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• 'MTR in Detail

| Type number | Motor | Description |
|---|---|---|
| 00 | M6 (pick-up motor) | Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. |
| 02 | M4 (main motor) | Operates for 120 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (each drive clutch, off) |
| 03 | M8 (hopper motor) | Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (each drive clutch, off) |
| 04 | M10 (transfer drum cleaner motor) | Operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops. (transfer drum cleaner not in contact with transfer drum) |
| 05 | M9 (cleaner assembly reciprocating motor) | Rotates the photosensitive drum motor at speed 1 (for plain paper); operates for 10 sec, stops for 3 sec, and operates again for 10 sec, and then stops.<br>Stops the photosensitive drum motor. |
| 06 | M3 (laser scanner motor) | Operates for 10 sec, stops for 3 sec, and rotates continuously. |
| 07 | M5 (fixing motor) | Rotates for 10 sec in speed 1 (for plain paper), rotates for 10 sec in speed 2 (for plain paper 2 sides), rotates for 10 sec in speed 3 (for thick paper), rotates for 10 sec in speed 4 (for OHP), and then stops for 3 sec.<br>The above operations are repeated three times. |
| 08 | M2 (photosensitive motor) | Rotates for 10 sec in speed 1 (for plain paper), rotates for 10 sec in speed 2 (for plain paper 2 sides), rotates for 10 sec in speed 3 (for thick paper), rotates for 10 sec in speed 4 (for OHP), and then stops for 3 sec.<br>The above operations are repeated three times. |
| 09 | M7 (primary corona wire cleaning motor) | Executes 1 round-trip cleaning operation. |

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| Type number | Motor | Description |
|---|---|---|
| 16 | M11 (brush drive motor) | Searches for home position.<br>After the move to the point of retention, stops for 3 sec.<br>After the move to the point of retention/transfer, stops for 3 sec.<br>After the move to the point of transfer, stops for 3 sec.<br>After the move to the point of transfer/push-on brush on position, stops for 3 sec.<br>Searches for home position.<br>The above operations are repeated twice. |
| 17 | M17 (duplexing unit reversing assembly switchback motor) | Executes pull-in operation for 3 sec (rotation at low speed).<br>Executes pull-in operation for 3 sec (rotation at high speed).<br>Executes feed-out operation for 3 sec (rotation).<br>Stops for 3 sec.<br>Executes pull-in operation for 3 sec (rotation at high speed).<br>Executes feed-out operation for 3 sec (rotation).<br>Stops |
| 18 | M16 (paper jogging guide drive motor) | Searches home position, and then stops for 3 sec.<br>After the move to the A4 position, stops for 3 sec.<br>After the move to the B4 position, stops for 3 sec.<br>After the move to the A4R position, stops for 3 sec.<br>After the move to the B5R position, searches home position. |

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## FAN in Detail

| Type number | Fan | Description |
|---|---|---|
| 00 | FM15 (feeding fan 2) | Operates for 5 sec, stops for 5 sec, and operates again for 5 sec, and then stops. |
| 01 | FM14 (feeding fan 1) | Operates for 5 sec, stops for 5 sec, and operate for 5 sec, and then stops. |
| 02 | FM2 (primary corona assembly fan) | Operates for 5 sec, stops for 5 sec, and operates continuously. |
| 03 | FM4 (ozone suction fan 1) | Operates for 5 sec, stops for 5 sec, and then operates continuously. |
| 04 | FM13 (ozone suction fan 2) | Operates for 5 sec, stops for 5 sec, and operates continuously. |
| 05 | FM12 (developing bias power supply PCB cooling fan) | Operates for 5 sec, stops for 5 sec, and operates again for 5 sec, and then stops. |
| 16 | FM10 (electrical unit fan 1) | Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operations again for 5 sec (50%), and then operates continuously. |
| 18 | FM9 (IP cooling fan) | Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operations again for 5 sec (50%), and then operates continuously. |
| 19 | FM3 (fixing heat exhaust fan) | Operates for 5 sec (100%), and operates again for 5 sec (50%), and then stops; further, operates for 5 sec (100%), and operates again for 5 sec (50%), and then operates continuously. |

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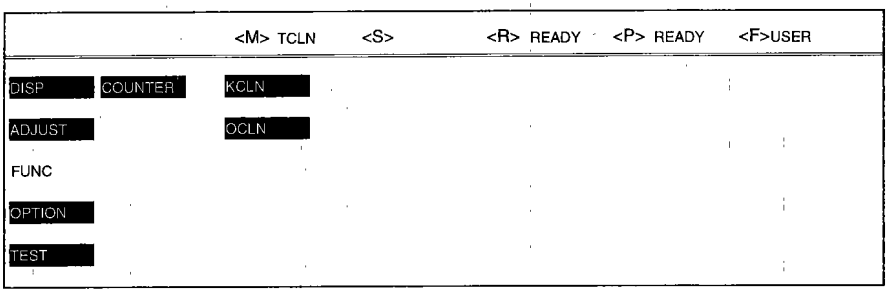
## 14. Movement of the Polishing Roller/Oil Removing Roller




| Item | Description | Remarks |
|---|---|---|
| KCLN | The polishing roller is moved into contact and rotated while the transfer drum is rotating (about 3 min).<br>During operation, '<P> SERVICE'. | The operation ends automatically after a specific period of time. |
| OCLN | The oil removing roller is moved into contact and rotated while the transfer drum is rotating (about 3 min).<br>During operation, '<P> SERVICE'. | |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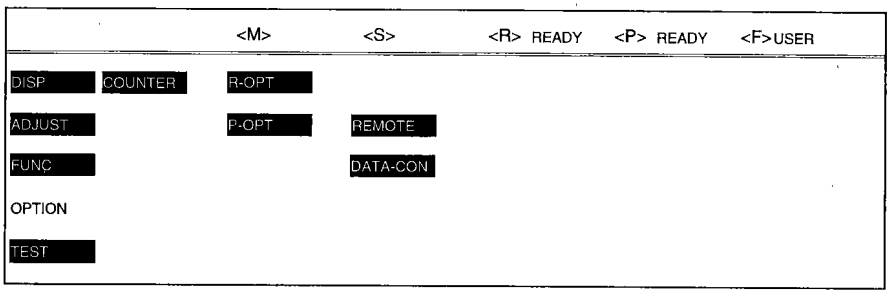
# E. Machine Settings Mode (OPTION)

## Setting Mode




| | | |
|---|---|---|
| 1 | R-OPT | Use it to select machine settings related to the reader unit. |
| 2 | P-OPT | Use it to adjust the transfer drum stop position (cleaning mode). |
| 3 | REMOTE | Use it to set the parameters when an external controller is connected. |
| 4 | DATA-CON | Use it to note that a connection is made to the Copy Data Controller A1. |

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## 1. Machine Settings Mode (reader unit)

<M> R-OPT <S> <R> READY <P> READY <F>USER

DISP
COUNTER
ADJUST
FUNC
OPTION
TEST
P-SIZE xx
OHP-MODE xx
METAL xx
CONTROL xxxx
DF-AUTO x
MANAGE xx
NEW-COL xx
COIN-SET xx

| Item | Description | Remarks |
|---|---|---|
| P-SIZE<br>(See note) | Use it cause the machine to identify the size of copy paper and transparencies. | 0: AB<br>1: inch<br>2: A<br>3: all |
| OHP-MODE<br>(See note) | Use it to select the maximum density of the copy image on transparencies.<br>0: Dmax=1.3<br>1: Dmax=1.7 | settings: 0 to 3<br>standard: 0<br>However only '0' and '1' are enabled at present. |
| METAL<br>(See note) | Use it to specify whether to use 'precious metal mode' or not in user mode. | 0: enable<br>1: disable |
| CONTROL | You may permit copying, printing, or scanning operation with conditions by changing the low-order three digits in the absence of a control key, control card, or ID number.<br>For instance, if 'CONTROL' is set to '002', in the absence of a control key you may use the IPU1 protocol to generate black-and-white/color printouts, use the IPU2 protocol to generate black-and-white/color printouts, use the IPU1 protocol to initiate scanning, or use the IPU2 protocol to initiate scanning. | Note:<br>Controllers of IPU1 Protocol<br>IPU10, IPU10S, PS-IPU III (Ver. 1.0), Color Pass 1000 (Ver. 1.0), IPU II(CLC350/550 Board), PS-XJ (Step 1,2), Color Pass 2000/3000/4000 (Step 1,2)<br>Controllers of IPU2 Protocol<br>F/S III, PS-IPU III (Ver. 1.1), Color Pass 1000 (Ver. 1.1), IPU II (CLC700/800 Board), PS-XJ (Step 3), Color Pass 2000/3000/4000 (Step 3) |

Releasing with Control Key Condition

| 1st digit of 'CONTROL' | B/W copy | B/W print-out | | | Color print-out | | | Scanning | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | IPU1 | PS-IPU | IPU2 | IPU1 | PS-IPU | IPU2 | IPU1 | PS-IPU | IPU2 |
| 0 | × | × | × | × | × | × | × | × | — | × |
| 1 | × | × | × | × | × | × | × | ○ | — | ○ |
| 2 | × | ○ | × | ○ | ○ | × | ○ | ○ | — | ○ |
| 3 | ○ | × | × | ○ | × | × | × | ○ | — | ○ |
| 4 | ○ | ○ | × | ○ | ○ | × | ○ | ○ | — | ○ |

Releasing with Control Card Condition

| 2nd digit of 'CONTROL' | B/W copy | B/W print-out | | | Color print-out | | | Scanning | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | IPU1 | PS-IPU | IPU2 | IPU1 | PS-IPU | IPU2 | IPU1 | PS-IPU | IPU2 |
| 0 | × | × | × | × | × | × | × | × | — | × |
| 1 | × | × | × | × | × | × | × | ○ | — | ○ |
| 2 | × | ○ | ○ | ○ | ○ | ○ | ○ | ○ | — | ○ |
| 3 | ○ | × | × | ○ | × | × | × | ○ | — | ○ |
| 4 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | — | ○ |


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<table>
<tr><th>Item</th><th>Description</th><th>Remarks</th></tr>
<tr><td>CONTROL</td><td>Releasing with ID No. Condition
<table>
<tr><th rowspan="2">3rd digit of 'CONTROL'</th><th rowspan="2">B/W copy</th><th colspan="3">B/W print-out</th><th colspan="3">Color print-out</th><th colspan="3">Scanning</th></tr>
<tr><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th><th>IPU1</th><th>PS-IPU</th><th>IPU2</th></tr>
<tr><td>0</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>—</td><td>×</td></tr>
<tr><td>1</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>2</td><td>×</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>3</td><td>○</td><td>×</td><td>×</td><td>○</td><td>×</td><td>×</td><td>×</td><td>○</td><td>—</td><td>○</td></tr>
<tr><td>4</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>—</td><td>○</td></tr>
</table>
○: permit.<br>×: prohibit.<br>IPU1: Controller of IPU1 protocol.<br>IPU2: Controller of IPU2 protocol.<br>PS-IPU: PS-IPU controller.</td><td></td></tr>
<tr><td>DF-AUTO</td><td>Use it to set auto start for RDF manual feeding.<br>0: w/ auto start<br>1: w/o auto start</td><td></td></tr>
<tr><td>MANAGE</td><td>Use it to simulate hues of offset printing.<br>0: standard<br>1: offset printing<br>If 'MANAGE' is set to '1', the offset Printing mode button will be indicated on the user mode screen.<br>If the value of 'OPTION' 'R-OPT' 'NEW-COL' is '1' and the value of 'MANAGE' is set to '1', set the value of 'ADJUST' 'COL-ADJ' 'P-ADJ' to M=0, C=0, Y=0, K=0.</td><td>Setting: 0,1<br>Standard: 0<br>For fine-adjusting hues, see the description of 'ADJUST' → 'COL-ADJ' →'P-TGL-M/C/Y/K' (service mode).</td></tr>
<tr><td>NEW-COL</td><td>Use it to improve reproduction of human skin tone.<br>0: standard<br>1: enhance<br>If the value of 'NEW-COL' is set to '0', set the value of 'REMOTE' 'OPTION' 'EM-TYPE' to '0'.</td><td>Setting: 0, 1<br>Standard: 1</td></tr>
<tr><td>COIN-SET</td><td>Use it to set coin operation mode (back-up).<br>0: standard, displays the standard screen (without a control card)<br>1: displays a screen with the message "Insert a coin."<br>2: displays a screen with the message "Insert a copying card."<br>In 1 or 2, no animation is used on the screen.</td><td>Setting: 0, 1, 2<br>Standard: 0</td></tr>
</table>

**Note:**

If you replaced a PCB or cleared a RAM, the values are reset to standard values, necessitating re-input. Make sure you record the items and the values whenever you must change the values on the service label in consideration of this.

**Reference**

An OHP projector may be a reflecting type or a transmitting type. If the installed projector is a transmitting type, the user can expect better results if the copy image maximum density is lower; select the appropriate setting according to the type of projector.

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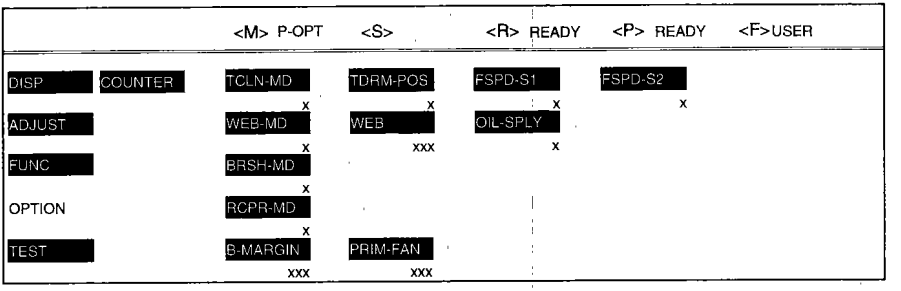
## 2. Setting Cleaning Mode/Transfer Drum Stop Position




| Item | Description | Remarks |
|---|---|---|
| TCLN-MD | Use it to select the appropriate cleaning sequence for the transfer drum.<br>0: Cleaning for a single rotation of the transfer drum.<br>1: Cleaning for two rotations of the transfer drum. | Settings : 0,1 |
| TDRM-POS | Use it to change the stop position of the transfer drum. | Settings : 0 ~ 4<br>Standard: 1 |
| FSPD-S1 | Use it to change the fixing speed for special paper 1.<br>0: normal (plain paper)<br>1: 2nd side in 2-sided copying (plain paper)<br>2: thick paper<br>3: special paper 2 | Setting: 0 to 3<br>Standard: 1<br>During copying, the fixing web remains in contact. |
| FSPD-S2<br>(See note 2) | Use it to change the fixing speed for special paper 2.<br>0: normal (plain paper)<br>1: 2nd side in 2-sided copying (plain paper)<br>2: thick paper<br>3: special paper 2 | Setting: 0 to 3<br>Standard: 3<br>During, copying, the fixing web remains off contact. |
| WEB-MD | Use it to change the on/off sequence of the cleaning belt solenoid.<br>(At present, only '1' is available.) | Standard: 1 |
| WEB<br>(See note 1) | Use it to change the frequency at which the cleaning belt solenoid turns on.<br>The notation 'x' represents the number of small-size copies; x=setting. | Settings : 1 ~ 255<br>Standard: 8 |
| OIL-SPLY | Use it to switch oil supply.<br>0: by service person<br>1: by user<br>When the oil starts to run out while the item is set to 'by user', the message "Supply Oil to Fixing Assembly" will be indicated on the control panel. | Setting: 0, 1<br>Standard: 1 |
| BRSH-MD<br>(See note 1) | Use it to change the sequence of engaging the attraction brush when thick LTRR paper is being fed.<br>0: engage the brush only when attraction charging is on.<br>1: engage the brush throughout copying sequence. | Settings : 0 ~ 3<br>Standard: 1<br>'2' and '3' are not used. |

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| Item | Description | Remarks |
|---|---|---|
| RCPR-MD | Use it to set the functions for the reciprocating motor in the drum cleaning assembly.<br>2: do not perform reciprocating operation.<br>3: perform reciprocating operation only during last | Settings : 0 to 4<br>Standard: 3<br>Do not use a setting other than '3'. |
| B-MARGIN | Use it to change the trailing edge margin.<br>0: 4.5 mm<br>1: 2.5 mm | See "Changing the Image Trailing Edge Margin." |
| PRIM-FAN | Use it to select the on/off timing for the primary charging fan.<br>0: longer activation period for primary charging fan<br>1: shorter activation period for primary charging fan | Setting: 0, 1<br>Standard: 1 |

**Note 1:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

**Note 2:**

If lines of oil are noted in high-density areas when images are copied on cast-coated paper in thick mode,

1) Change the setting of 'FSPD-S2' under 'P-OPT' of 'OPTION' in service mode from '3' to '2'.
2) The label on the paper used wrap the sheets may recommend copying in thick paper mode; however, advise user to use special paper 2 mode after changing the setting.

**Reference**

- 'TCLN-MD' will prove effective when the backs of copies tend to become soiled.
- 'TDRM-POS' will prove effective when image faults are caused by residual memory on the drum.
- 'BRSH-MD' will prove effective when color displacement is noted when thick LTRR paper is fed.

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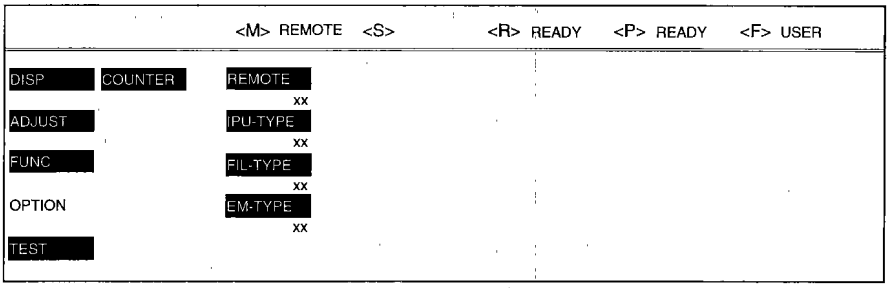
## 3. Selecting Machine Specifications when Using an External Controller




| Item | Description | Remarks |
|---|---|---|
| REMOTE | Enter settings for A, B, and C of the table below.<br>A: Decides whether the Call key should be used as a Remote key or not; if not used as a Remote key, the IPU's operation command activates remote state and, after operation, restores local state.<br>B: Decides whether a move from local state to remote state should be made and whether copy modes set in local state should be retained. | Settings : 0 ~ 7<br>Standard: 0 |
| IPU-TYPE<br><br>(See note) | Set it to match the external controller to be connected.<br>0: standard<br>1: PS-IPU III Ver.1.0 only. | Settings : 0 to 1<br>Standard: 0 |
| FIL-TYPE<br><br>(See note) | Use it to select edge emphasis on the output image from the controller to prevent tapering of fine lines.<br>0: not used<br>1: standard | Settings : 0 to 1<br>Standard: 1 |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| Item | Description | Remarks |
|---|---|---|
| EM-TYPE | Use it to emulate other models when using the IPU.<br>0: Value of 'OPTION' 'R-OPT' 'NEW-COL' is set to '0'<br>1: Value of 'OPTION' 'R-OPT' 'NEW-COL' is set to '1'<br>■ From the controller to the images, sets the value set by <ADJUST><COL-ADJ><P-ADJ> and <ADJUST><COL-ADJ><P-OFST>.<br>■ To the reader images, sets the value set by <ADJUST><COL-ADJ><COL-ADJ> and <ADJUST><COL-ADJ><OFST>.<br>2: Identical to the hue by the IPU10S/CLC800 when the IPU2 (native mode) is connected.<br>■ The following is set according to the gamma specified by the IPU2:<br>• Switches the LOG table for the IPU.<br>• Switches the masking coefficient.<br>3: Identical to the hue by the IPU10S/CLC500 when the IPU2 (native mode) is connected.<br>■ From the controller to the images, sets the value set by <ADJUST><COL-ADJ><P-ADJ> and <ADJUST><COL-ADJ><P-OFST>.<br>■ To the reader images, sets the value set by <ADJUST><COL-ADJ><COL-ADJ> and <ADJUST><COL-ADJ><OFST>.<br>■ The following is set according to the gamma specified by the IPU2:<br>• Switches the LOG table for the IPU.<br>• Switches the masking coefficient. | Settings: 0 to 3<br>Standard: 1 |

- **Detail of Settings**

| Settings | A | B | C |
|---|---|---|---|
| REMOTE = 0,1 | Call key | Retain | Local |
| 2,3 | Call key | Do not retain | Local |
| 4,5 | Remote key | Retain | Local |
| 6,7 | Remote key | Do not retain | Local |

**Note:**

The value of the item returns to its default value when the PCB is replaced or the RAM is cleared; you must enter the value newly. If you entered a different value, be sure to record the item and the value on the service label.

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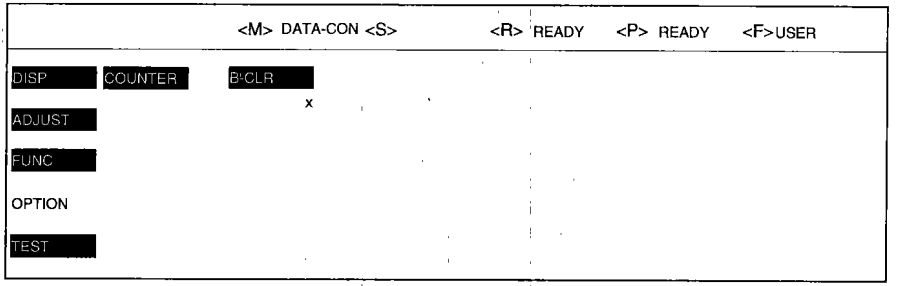
## 4. When Connected to the Copy Data Controller A1




| Item | Description | Remarks |
|---|---|---|
| B-CLR | Use it to indicate whether the Copy Data Controller A1 is connected (recognition will be automatic).<br>0: Not connected<br>1: Connected<br>If the setting is '1', an error code (E717) will be issued if the Copy Data Controller A1 is disconnected.<br>To clear 'E717',<br>• Press 'B-CLR'.<br>• Initialize the RAM of the reader controller. | Setting: 0, 1<br>Standard: 0<br>As necessary, set it to '0' during service work so as to temporarily disconnect the Copy Data Controller A1. |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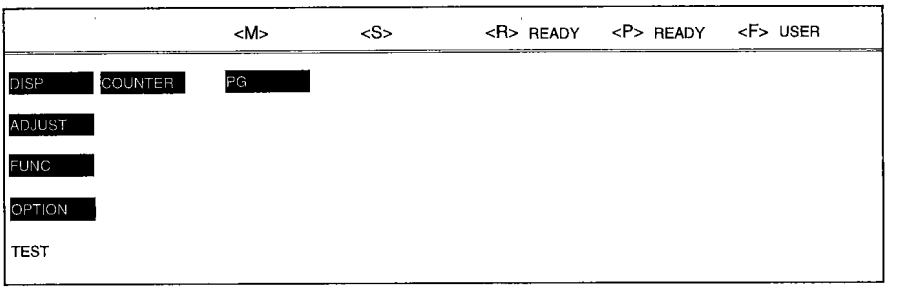
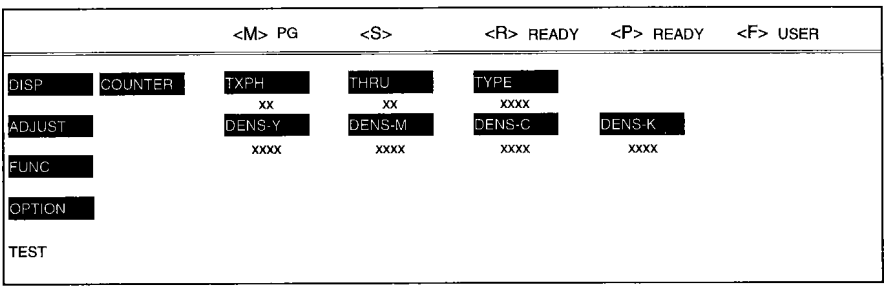
## F. Test Print




Be sure to return 'TYPE' to '0' when ending test print mode.

| Item | Description | Remarks |
|---|---|---|
| TYPE | Specify the type of test print.<br>0 : image from CCD (normal copy)<br>1 : for R&D<br>2 : 256 colors<br>3 : 256 gradations<br>4 : 16 gradations<br>5 : entire face in halftone<br>6 : grid<br>7 : for R&D 1<br>8 : for R&D 2<br>9 : for R&D3<br>10 : MCYBk horizontal stripe (laser FF)<br>11 : for R&D 4<br>12 : YMCBk 64 gradations<br>13 : BGR 64 gradations<br>14 : full-color 16 gradations (YMCBk)<br>15 : full-color light area 16 gradations (YMCBk)<br>16 : MCYBk horizontal stripe (laser A0) | Enter a number using the keypad (1 through 16); then, press the Copy Start key to generate a test print. To specify the output color for 3, 4, 5, and 6, use color mode (user mode).<br>• Be sure to return to '0' after generating a test print. |
| DENS-M/C/Y/K | PGTYPE=5 above: specifies the density of each color for full face in halftone. | 0 through 255<br>standard: 128 |

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| Item | Description | Remarks |
|---|---|---|
| TXPH | Use it switch between text mode and photo mode.<br>0 : text mode<br>1 : photo mode<br>Not effective if 'TYPE-6', i.e., grid. | Each press causes it to alternate between '0' and '1'. |
| THRU | Switches the gate array on the laser controller PCB. Not effective when 'TYPE' is set to '5' (halftone).<br>This is invalid for TYPE5 (halftone).<br>0 : Use gate array.<br>1 : Do not use gate array. | |


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# G. Counter

- After '999999', returns to '000000'.
- After pressing a sub item number (except 038, 039, 040) and the indication has reversed, a press on the Clear key causes the counter for the item to turn '000000'. (You cannot clear '014'; instead, clear '011', '012', and '013'.)
- Check the reading of '038' (3rd-level number) whenever you have replaced the cleaning belt for the fixing assembly; if not '0', press 'E005-RLS' of 'FUSER' under 'FUNC' to clear the counter reading.
- Further, executing 'RAM-CLR' for the reader controller PCB causes all sub items to be '00 0000' (except 038, 039, 040).

| | | <M> | | <S> | | <R> READY | | <P> READY | | <F> USER | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DISP | COUNTER | <001> | xxxx | <011> | xxxx | <021> | xxxx | <031> | xxxx | | |
| | | <002> | xxxx | <012> | xxxx | <022> | xxxx | <032> | xxxx | | |
| ADJUST | | <003> | xxxx | <013> | xxxx | <023> | xxxx | <033> | xxxx | | |
| | | <004> | xxxx | <014> | xxxx | <024> | xxxx | <034> | xxxx | | |
| FUNC | | <005> | xxxx | <015> | xxxx | <025> | xxxx | <035> | xxxx | | |
| | | <006> | xxxx | <016> | xxxx | <026> | xxxx | <036> | xxxx | | |
| OPTION | | <007> | xxxx | <017> | xxxx | <027> | xxxx | <037> | xxxx | | |
| | | <008> | xxxx | <018> | xxxx | <028> | xxxx | <038> | xxxx | | |
| TEST | | <009> | xxxx | <019> | xxxx | <029> | xxxx | <039> | xxxx | | |
| | | <010> | xxxx | <020> | xxxx | <030> | xxxx | <040> | xxxx | | |

| Item | Description | Item | Description |
|---|---|---|---|
| 001 | Number of times the Y developing assembly has been used. | 013 | Number of prints generated using the synthesis mechanism. |
| 002 | Number of times the M developing assembly has been used. | 014 | Number of total prints (copies, + prints, synthesized prints) |
| 003 | Number of times the C developing assembly has been used. | 015 | Number of sheets picked up from the cassette 1. |
| 004 | Number of times the K developing assembly has been used. | 016 | Number of sheets picked up from the cassette 3. |
| 005 | Number of Y mono copes. | 017 | Number of sheets picked up from the cassette 4. |
| 006 | Number of M mono copies made. | 018 | Number of sheets picked up from the multifeeder. |
| 007 | Number of C mono copies made. | 019 | Number of sheets picked up at the duplexing unit. |
| 008 | Number of K mono copies made. | 020 | Number of scans made by the scanning system. |
| 009 | Number of 3-color copies made. | 021 | Number of copies made using the film projector. |
| 010 | Number of 4-color copies made. | 022 | Number of sheets picked up from the RF. |
| 011 | Number of total copies made. | 023 | reserved |
| 012 | Number of total prints made. | 024 | reserved |

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| Item | Description | Item | Description |
|---|---|---|---|
| 025 | reserved | 038 | Represents the number of times the solenoid turns on between detection of the absence of the web and indication of 'E005'. (initially, 200; incremented by '1' for each activation) |
| 026 | reserved | | |
| 027 | reserved | | |
| 028 | reserved | | |
| 029 | reserved | | |
| 030 | reserved | 039 | Represents the number of copies made until the primary corona wire automatic cleaning mechanism operates next time (initially, '2000': a single copy decreases the count by '1'; a 4C copy, by '4'; a 3C copy, by '3'; and a mono-C copy, by '1'). |
| 031 | reserved | | |
| 032 | reserved | | |
| 033 | reserved | | |
| 034 | reserved | | |
| 035 | reserved | 040 | Represents the number of copies made until the polishing roller cleaning mechanism operates next time (initially, '1200'; decreased by 1 for copy). |
| 036 | reserved | | |
| 037 | reserved | | |


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# H. Adjusting the Electrical system

(For descriptions on how to adjust the mechanical system, see P.4-105.)

The copier's major PCBs are equipped with variable resistors (VR), and all VRs are adjusted at the factory with high precision.

As a rule, do not touch those VRs not discussed herein in the field, as they require high precision.

## 1. After Replacing Major Parts

### a. After Replacing the Developer (MCY)

1) Execute 'STIR' in service mode ('FUNC').
2) Have the machine read the toner density data using 'INIT-M, INIT-C, INIT-Y' under 'INSTALL' in service mode ('FUNC').
3) Record the result (those indicated by * in Figure 3-1104) on the service label.
4) Leave service mode, and turn off and then on the power switch.

### b. After Replacing the Developer (Bk)

1) Execute 'STIR' in service mode ('FUNC').
2) Have the machine read the toner density data using 'INIT-K' under 'INSTALL' in service mode ('FUNC').
   When 'INIT-K' ends, take notes of the value of 'SGNL-K'.
3) Select 'DC-CON' under 'FUNC', and enter a value obtained by adding '37' to the value you took note of in step 2) into 'SGNL-K'.
4) Press 'SEND', and leave service mode; then, turn off and then on the power switch.
   If you have replaced all four colors, have the machine read the toner density data using 'INIT-4' under 'INSTALL' in service mode ('FUNC').

### c. After Replacing the Developing Assembly (MCYK), Toner Density Sensor (MCY), or Black Toner Density Sensor

1) Replace the developer.
2) Go through steps under a. or b. above.

### d. After Replacing the Photosensitive Drum Unit

1) After replacing the cleaning blade, apply lubricant.
2) Install the photosensitive drum.
3) Clean the window of the black toner density sensor (dry wiping) ; and apply lubricant to the No. 2 blade.
4) Replace the black developer.
5) Go through the steps under b. given for the replacement of the developer (Bk).

| | TYP | | | |
|---|---|---|---|---|
| B5-C1 | | | | |
| A4-C1 | | | | |
| STMTR-C2 | | | | |
| A4R-C2 | | | | |
| STMTR-C3 | | | | |
| A4R-C3 | | | | |
| STMTR-C4 | | | | |
| A4R-C4 | | | | |
| A6R-MF | | | | |
| A4R-MF | | | | |
| A4-MF | | | | |
| * SGNL-M | | | | |
| * SGNL-C | | | | |
| * SGNL-Y | | | | |
| * SGNL-K | | | | |
| * SGNL-D | | | | |
| * REF-M | | | | |
| * REF-C | | | | |
| * REF-Y | | | | |
| * REF-K | | | | |
| * REF-D | | | | |
| * SGAIN-M | | | | |
| * SGAIN-C | | | | |
| * SGAIN-Y | | | | |
| * SGAIN-K | | | | |
| * REF-G-K | | | | |
| EPOT-OFST | | | | |
| ATT-T-A | | | | |
| ATT-T-B | | | | |
| RG-XA | | | | |
| RG-XB | | | | |
| RG-Y | | | | |
| TR-DELAY | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| BODY-NO | | | | |

FS5-8837

Figure 3-1104

| | TYP | | |
|---|---|---|---|
| CVR-TYPE | | | |
| ADJ-X | | | |
| ADJ-Y | | | |
| ADJ-S | | | |
| ED-ADJ-X | | | |
| ED-ADJ-Y | | | |
| ADJ-J | | | |
| EC-GLASS | | | |
| DA-XS | | | |
| DA-XE | | | |
| DA-YS | | | |
| DA-YE | | | |
| DS-DOC | | | |
| DS-PRJ | | | |
| DS-OHP | | | |
| ADJ-M | | | |
| ADJ-C | | | |
| ADJ-Y | | | |
| ADJ-K | | | |

| | TYP | | |
|---|---|---|---|
| OFST-M | | | |
| OFST-C | | | |
| OFST-Y | | | |
| OFST-K | | | |
| SEG-ADJ | | | |
| BC-ADJ | | | |
| LGCR-IPU | | | |
| * LAMP-DT | | | |
| * GAIN-B | | | |
| * GAIN-G | | | |
| * GAIN-R | | | |
| * TARGET-B | | | |
| * TARGET-G | | | |
| * TARGET-R | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Figure 3-1105

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**e. After Replacing the DC Controller PCB**

1) Replace the developer (all four colors), and execute 'STIR-4' and 'INIT-4' under 'INSTALL' in service mode ('FUNC').
2) Record the results (those indicated by * in Figure 3-1104) on the service label; however, for 'SGNL-K', record a value obtained by adding '37' to the result.
3) Enter the values recorded on the service label (those not indicated by *) using 'DC-CON' under 'FUNC'; however, for 'SGNL-K', enter the value recorded on the service label.
4) When you have pressed all values, turn off and then on the power switch.
5) Set 'PASCAL' under 'ADJUST' in service mode to '1'.

**f. After Replacing the ROM on the DC Controller PCB**

1) Execute 'RAM-CLR' under 'D-CON' in service mode ('FUNC').
2) Go through the steps under"e. After Replacing the DC Controller PCB," starting with step 2).

**g. After Replacing the Reader Controller PCB**

1) Enter the values recorded on the service label (those indicated by * in Figure 3-1105) using 'R-CON' under 'FUNC'.
2) Execute 'AUTO-ADJ' under 'CCD' in service mode ('FUNC'), and record the result (those indicated by * in Figure -3-1105) on the service label.

- If a projector is installed, execute 'PROJ-CCD' under 'PRJ-ADJ' in service mode ('FUNC').

3) When you have entered all the values, turn off and then on the power switch.

**h. After Replacing the ROM on the Reader Controller PCB**

1) Execute 'RAM-CLR' of 'R-CON' under 'FUNC' in service mode.
2) Go through the steps for "g.After Replacing the Reader Controller PCB" starting with step 1.

**i. After Replacing the Laser Unit, Laser Controller PCB**

1) Adjust the laser power.
2) Adjust the laser.
3) Replace the black developer.
4) Execute 'INIT-K' of 'INSTALL' under 'FUNC' in service mode to read the toner density data.

**j. After Replacing the Scanning Lamp, Standard White Plate, Lamp Regulator, Lamp Reflecting Plate, or Analog Processor PCB**

1) According to 'AUTO-ADJ' of 'CCD' under 'FUNC' in service mode, read in the data.

**k. After Replacing the Transfer Drum**

1) Execute the following in the order given in service mode:

ADJUST
  IMG-REG
    REG-XA
    REG-XB
    REG-Y
FUNC
  ATTRACT
    ATT-T-A
    ATT-T-B
    TR-DELAY

**l. After Replacing the BD Unit (beam detector assembly)**

Make adjustments as follows whenever you have replaced the BD unit:

1) Set the meter to the VAC RANGE.
2) Connect the + probe of the meter to the check pin TP301 on the BD PCB and the – probe to the check pin GND.
3) Activate the laser in service mode ('FUNC'→'LASER'→'POWER').
4) Loosen the screw used to fix the BD unit in place, and fix it in position where the tester output reading is maximum.

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## 2. Adjusting the Laser Power

You must adjust the laser power whenever you have replaced the laser scanner, laser unit, or laser driver PCB.

If you have adjusted the laser power or laser, you must always replace the Bk developer, adjust the Bk toner density VR, and execute Bk toner density initial settings read-in.

### a. Tools

- Laser power checker (FY9-4013)
- Digital multimeter (CK-0436)

**Caution:**

The output of the laser power checker tends to change over time; be sure to have it calibrated using the special laser power checker calibrator at one-year intervals.

1) Turn off the power switch.
2) Open the left door, remove the four screws ①, and remove the left inside cover.

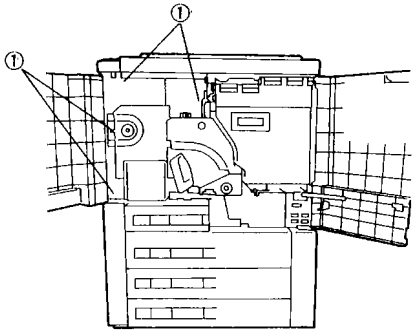


**Figure 3-1106**

3) Loosen the two screw ②, and remove the laser power checker slot cover③.

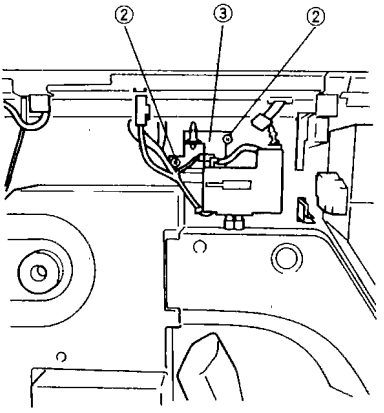


**Figure 3-1107**

4) Set the laser power checker switch to '2'.
5) While keeping the light-receiving face of the laser power checker ④ on the right, insert the laser power checker into the slot ⑤.

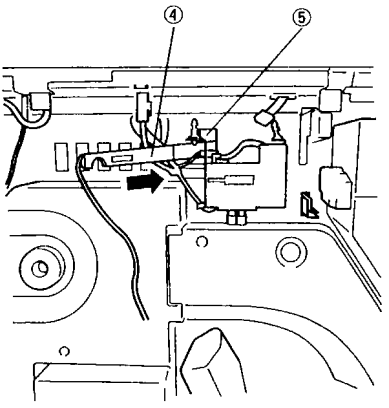


**Figure 3-1108**

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6) Insert the lead wire of the laser power checker into the digital multimeter, and set the range to 200 mVDC.
7) Insert the door switch actuator into the front door switch, and turn on the power.
8) Activate service mode, and select 'POWER' of 'LASER' under 'FUNC' in service mode.
9) Check that the reading is as indicated in the label on the laser unit. If not, turn VR956 for rough adjustment, and turn VR955 for fine adjustment until the reading matches the value indicated in the label.

**Making Adjustments**

1) Open the front left door.
2) Remove the two hopper stoppers, and open the hopper.
3) Adjust VR956 and VR955 by inserting a screwdriver through the hole in the front side plate.

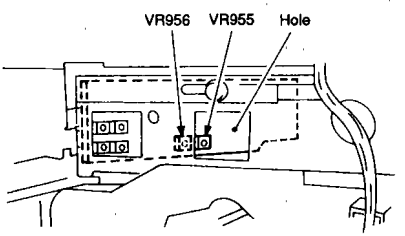


**Figure 3-1109**

**Caution:**

- Check the upper limit recorded in the label attached to the laser unit in advance.

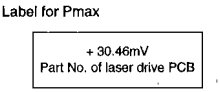


**Figure 3-1110**

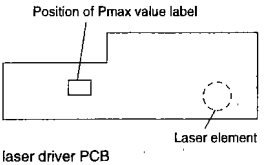


**Figure 3-1111**

- Turn VR956 slowly while checking the output of the laser power checker; avoid increasing the laser power excessively.
- A counterclockwise turn of VR956 lower the laser output.
- Make sure that the upper limit recorded in the label is not exceeded; otherwise, the laser diode may become damaged.

10) Press the C/▼ key.
11) Adjust the laser.

## 3. Adjusting the Laser

**Caution:**
Be sure to adjust the laser power before adjusting the laser.

1) Select 'TX-V00' of 'LASER' under 'FUNC' in service mode.
2) Turn VR952 clockwise, and make notes of the value at which it stops changing (offset value).
3) Turn VR952 until the following value is obtained true:
   offset value + 0.1 mV
   (tolerance $\pm \frac{0}{0.1}$ mV)
4) Likewise, make adjustments for 'TX-Vff, PH-V00, PH-VFF' in the order given and with reference to the following table; to stop the laser output, press the C/▼ key.

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| | VR | Standards (mV) |
|---|---|---|
| TX-$V_{00}$ | 952 | offset value +0.1 $\pm^{0}_{0.1}$ |
| TX-$V_{FF}$ | 951 | 0.8 x Pmax + 0.4 ±0.3 |
| PH-$V_{00}$ | 954 | offset value + 0.1 $\pm^{0}_{0.1}$ |
| PH-$V_{FF}$ | 953 | 0.8 x Pmax + 0.4 ±0.3 |

**Table 3-1102**

5) Press the Reset key to deactivate service mode; then, turn off the power switch.
6) Remove the laser power checker, and fix the slot cover in place.
7) Install the IP cooling fan duct and the left inside cover.

## 4. Checking the Environment Measuring PCB

Use the environment measuring PCB checking tool (TKN-0457) and environment sensor calibrating tool (TKN-0456) to check the environment measuring PCB and environment sensor.

① Checking the Environment Measuring PCB
1) Turn off the power switch.
2) Open the hopper assembly.
3) Remove the environment sensor from the environment measuring PCB; in its place, insert the environment measuring PCB checking tool (TKN-0457).
4) Insert the door switch actuator, and turn off the power switch.
5) Set the meter to the 30VDC range.
   Check that the voltage between J1-1 (+) and J1-2 (–) of the environment measuring PCB is 24 ±2.4 V.
   If it is not 24 ±2.4 V, check the DC power supply PCB (DCP1).
6) Activate service mode, and select 'DISPLAY'.
7) Check the temperature/humidity on the ANALOG screen.
   BODY °C ..... 25 ±5
   BODY % ..... 40 ±10
8) Check that the reading is within the specification.
   If it is not within the specification, go to step 9).
   If it is within the specification, go to step 14).
9) Press the Reset key, and turn off the power switch.
10) Disconnect connector J1 from the environment PCB.
11) Turn on the power switch, and activate service mode; then, select 'DISPAY'.
12) Check the temperature/humidity on the ANALOG screen.
    BODY °C ..... 25 ±5
    BODY % ..... 36 ±10
13) Check that the reading is within the specification.

**Reference:**
If it is outside the specification, suspect a fault in the DC controller PCB.

14) Press the Reset key.
15) Turn off the power switch.
16) Connect the connector J1 to the environment measuring PCB.
17) Remove the environment measuring PCB from the environment measuring PCB; in its place, insert the environment sensor.
18) Replace all covers.

② Checking the Environment Sensor
1) Check the environment measuring PCB.
2) Turn on the power, and leave the copier on for 5 min.
3) Activate service mode, and select 'DISPLAY'.
4) Check and take notes of the temperature/humidity on the ANALOG screen (data A).
   BODY °C ..... data A1
   BODY % ..... data A2
5) Press the Reset key, and turn off the power switch.
6) Remove the environment sensor from the environment measuring PCB; in its place, insert the environment sensor calibrator tool (TKN-0456).
7) Turn on the power switch, and leave the copier for 5 min.
8) Activate service mode, and select 'DISPLAY'.
9) Check and take notes of the temperature/humidity on the ANALOG screen (data B).
   BODY °C ..... data B1
   BODY % ..... data B2
10) Compare data A and data B.

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- difference between data A1 and data B1 is 0 ±5
- difference between data A2 and data B2 is 0 ±20

If the difference between data A and data B is outside the specification, replace the environment sensor.

11) Press the Reset key, and turn off the power switch.
12) Remove the environment sensor calibrator from the environment measuring PCB; in its place, insert the environment sensor.
13) Replace all covers.

**Caution:**
The environment sensor calibrating tool (TKN-0456) is adjusted at the factory with high precision; keep it in an air-tight container with a drying agent.

## 5. Storing the Cassette/Multifeeder Paper Width Basic Settings (FUNC)

Execute cassette/multifeeder paper width basic settings registration under the following conditions:

- After replacing the copier's paper width detecting VR (including the multifeeder).
- After adjusting the registration (front, rear) for the cassette.

For the cassette 1, you must register for B5 and A4; for each of the cassettes 2 through 4, you must register for STMTR and A4R; for the multifeeder, you must register for A6R, A4R, and A4.

**a. Cassettes 1 through 4**

1) Slide out the cassette for which you want to register the basic settings, and set the paper width guide plate inside the cassette to A4 (cassette 1) or A4R (cassettes 2 through 4).
2) Set the cassette in the copier.
3) Check that the control panel displays the basic settings on the CST-AD screen for 'FUNC' of service mode.
4) Select the size of the cassette for which you want to register the basic settings.
   C1-A4
   C2-A4R
   C3-A4R
   C4-A4R
5) Check that basic setting 1 has been registered.
6) Slide out the cassette for which you want to register the basic settings, and set the paper width guide plate to B5 (cassette 1) or STMTR (cassettes 2 through 7).
8) Set the cassette in the copier.
9) Check that the control panel displays the basic setting on the CST-AD screen under 'FUNC' of service mode.
10) Select the size of the cassette for which you want to register the basic settings.
    C1-B5
    C2-STMTR
    C3-STMTR
    C4STMTR
11) Check that basic setting 2 has been registered.

**b. Multifeeder**

1) Set the multifeeder manual feed guide to A6R (105 mm).

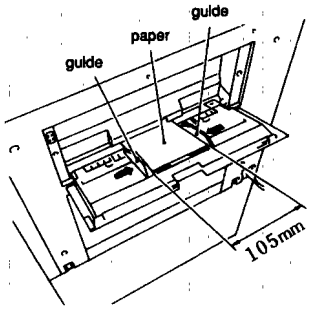


**Figure 3-1112**

2) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
3) Select the size for which you want to register the basic setting.
   MF-A6R
4) Check that basic setting 1 has been registered.
5) Set the multifeeder manual feed guide plate to A4R (210 mm).
6) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
7) Select the size for which you want to register

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the basic settings.
MF-A4R

8) Check that basic setting 2 has been registered.
9) Set the multifeeder manual guide plate to A4 (297 mm).
10) Check that the control panel displays the basic settings on the CST-AD screen under 'FUNC' of service mode.
11) Select the size for which you want to register the basic settings.
MF-A4
12) Check that basic setting 3 has been registered.

**Caution:**
Whenever you have registered basic settings, be sure to record them on the Service Label.
Further, if you have replaced the DC controller PCB, you must store the settings recorded on the Service Label using 'DC-CON' under 'FUNC' of service mode.

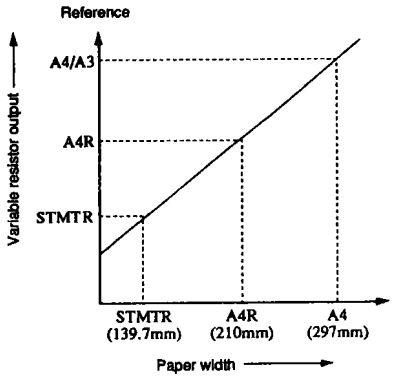


**Figure 3-1113**

# I. Test Print

The copier has 12 types of test print patterns, each one of which may be used to identify a specific image problem. If a problem in copies made in normal mode is not noted in a test print, you may suspect a problem in the scanning system, CCD, analog processor, or image processor.

## 1. Selecting a Test Print Pattern

1) Set the copy count, copy paper size, and color mode*.
   * The color mode is effective when PGTYPE=3, 4, 5, 6.
2) Activate service mode (* → 2, 8→ *)
3) Press 'TEST' under 'OPTION'.
4) Select 'PGTYPE'.
5) Enter a PGTYPE number.
6) Press the Copy Start key.

**Caution:**
You must return the setting of 'PGTYPE' to '0' after finishing checks using test prints.

- **Setting the Test Print Density (DENS-Y, -M, -C, and -Bk)**

This is effective when generating test prints when 'PGTYPE=5 or 6'.

1) Set the density by pressing 'DENS-Y, -M, -C, or -K'.

| PGTYPE | Description |
|---|---|
| 0 | Image from CCD (normal copy) |
| 1 | For R&D |
| 2 | 256 colors |
| 3 | 256 gradations |
| 4 | 16 gradations |
| 5 | Full-face halftone |
| 6 | Grid |
| 7 – 9 | For R&D |
| 10 | MCYBk horizontal stripe (laser FF activation) |
| 11 | For R&D |
| 12 | YMCBk 64 gradations |
| 13 | BGR64 gradations |
| 14 | Full color 16 gradations (YMCBk) |
| 15 | Full color light area 16 gradation (YMCBk) |
| 16 | MCYBk horizontal stripe (laser A0 activation) |

**Table 3-1103**

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## 2. Horizontal Test Print (PGTYPE= 10, 16)

With the horizontal test print, you can check the density of dark areas for each color, balance among colors, and white lines in relation to development.

### a. Dark Area Density of Each Color and Balance among Colors

The density must not be appreciably low.

If the density is too low for a mono color, suspect the developing assembly used for light color.

If the density is too low for all colors, suspect the laser system.

### b. White Lines (development)

If, for example, white lines are noted within the cyan areas of the copy image, suspect the developing assembly used for cyan.

### c. Uneven Density between Left and Right

If uneven density between left and right occurs in the same way for all colors, suspect that the developing assembly spacer or butting block is soiled or the height of the primary corona wire is not correct.

### d. Image Position (left/right)

If the position of the cassette holder or 'ADJ-X, Y' setting is not correct, copy paper and images cannot be aligned correctly, eliminating the non-image width.

This will lead to stray toner, soiling the inside of the machine.

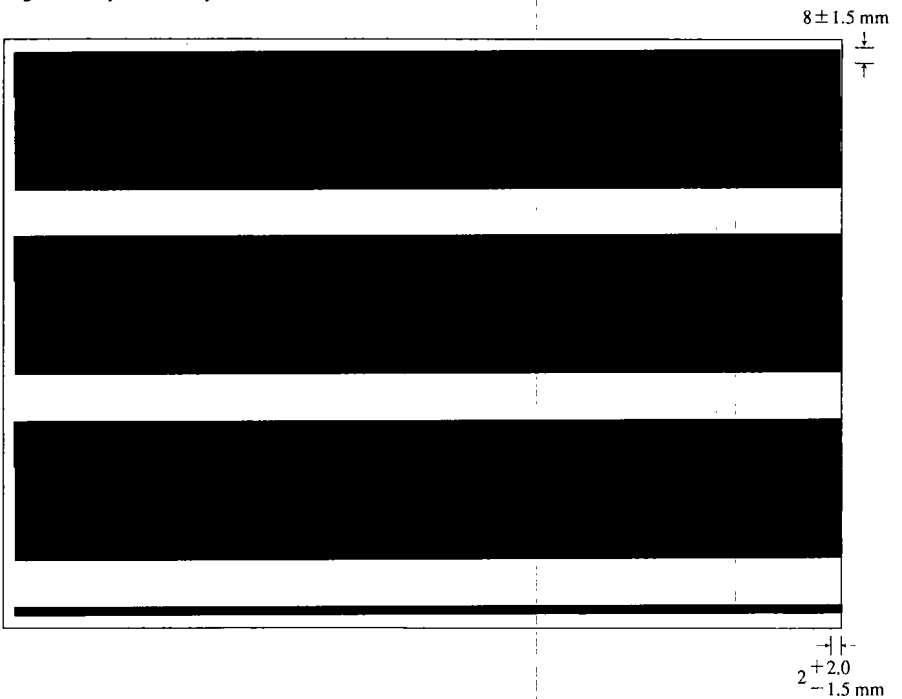


Figure 3-1114


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### 3. 256-Color Test Print (PGTYPE=2)

With the 256-color test print, you can mainly check the hues.

The 256-color test print represents 256 colors in 16x16 frames running from the leading edge of the copy paper.

**a. Tinges of 256 Colors**

The tinges shown in Figure 3-1115 must be reproduced.

If the tinges are different, suspect deterioration of the developer, deterioration of the photosensitive drum, or mixing of developers.

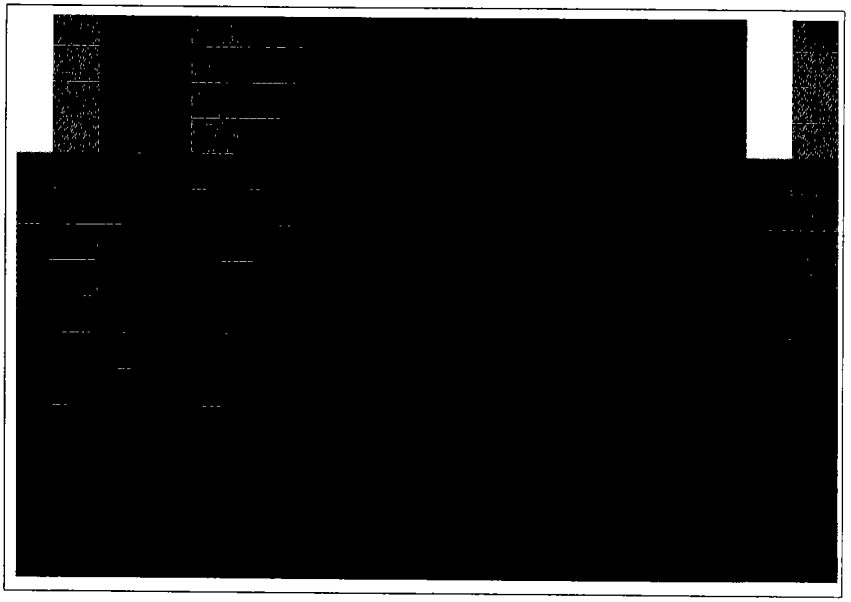

**Figure 3-1115**

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## 4. 256-Gradation Test Print (PGTYPE=3)

You may specify three colors and generate a test print to check the gray balance for all densities between density 0 and 255.

**a. Gradation**

You can check the gradation of all densities between 0 and 255.

**b. Color Balance (between colors; 3-color copying)**

You can check the gray balance of all densities between 0 and 255 by specifying 3-color printing when generating a test print.

**Caution:**
You can specify mono or 3-color mode in user mode.

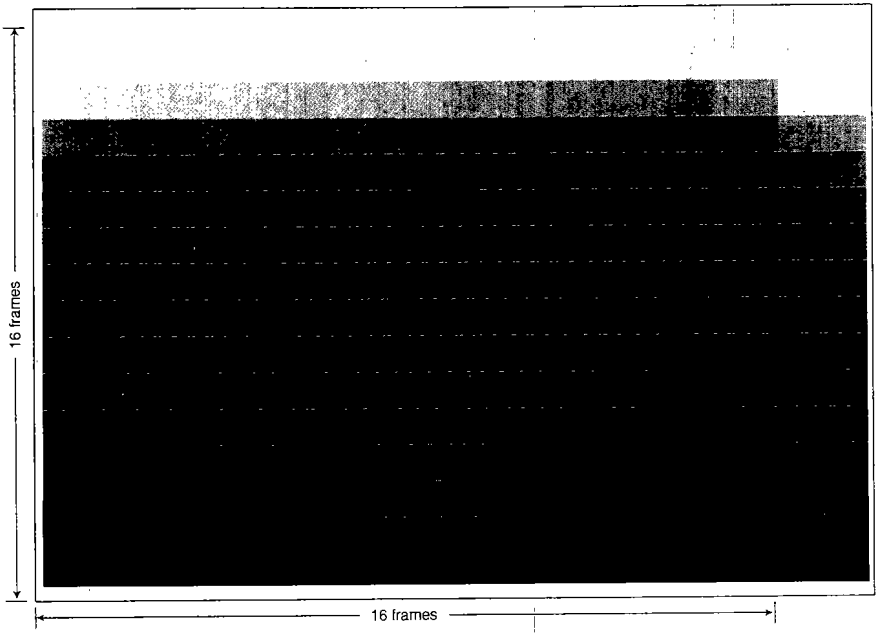


**Figure 3-1116**


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## 5. 16-Gradation Test Print (PGTYPE=4)

With the 16-gradation test print, you may mainly check the gradation, fogging, white lines, uneven density between left and right, and balance among colors.

**a. Gradation**

If the density in 16 gradations is not as shown in Figure 3-1117, suspect the laser system.

**b. Fogging**

If fogging is noted only in the white area shown in Figure 3-1117, suspect the developing system, photosensitive drum, or laser adjustment.

**c. White Lines**

If white lines are noted on the image, suspect the developing system.

**d. Uneven Density Between Left and Right**

If uneven density is noted between left and right, suspect chipping of the developing spacer, soiling of the butting block, or the height of the primary corona wire.

**e. Balance Among Colors (3-color copies)**

You can check the gray balance for each density by specifying 3-color mode and generating a test print.

**Caution:**
You can specify mono or 3-color mode in user mode.

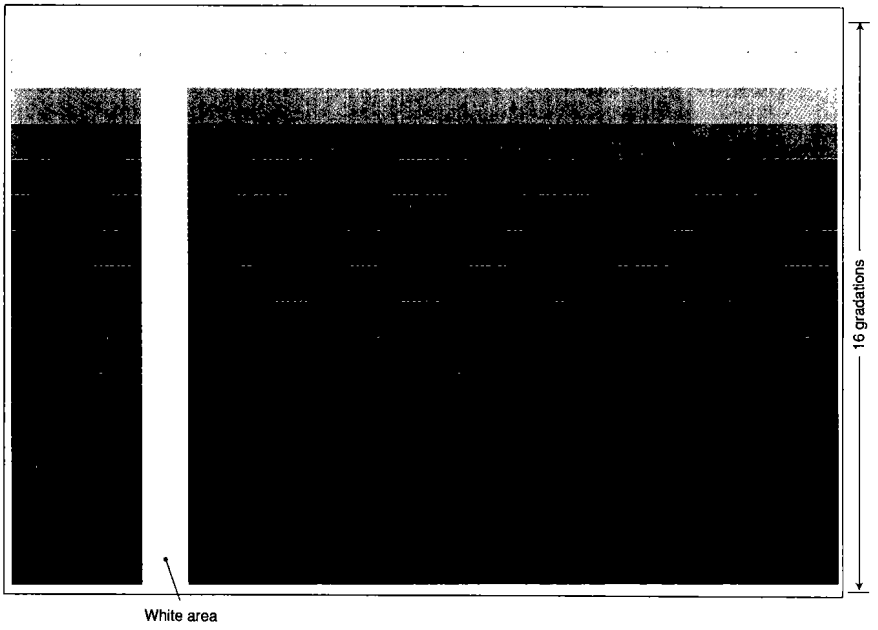


**Figure 3-1117**

## 6. Halftone Test Print (PGTYPE=5)

With the halftone test print, you can mainly check transfer failure, black lines, white lines, and uneven pitch.

### a. Transfer Failure

If transfer failure occurs, suspect the transfer drum sheet or static eliminator.

### b. Black Lines

If black lines occur, suspect scratches in the photosensitive drum or soiling of the primary corona wire.

### c. White Lines

If white lines occur at the same location for all colors, suspect the transfer drum sheet.

If the problem occurs at different locations or the problem is limited to a single color, suspect the developing assembly.

### d. Uneven Pitch

If uneven pitch occurs, suspect the following:

- scanner* 0.5 mm pitch (approx.)
- developing cylinder 42 mm (approx.)
- registration roller drive gear 1.6 mm (approx.)

*Does not occur on a test print.

**Caution:**
You can specify mono or 3-color mode in user mode.

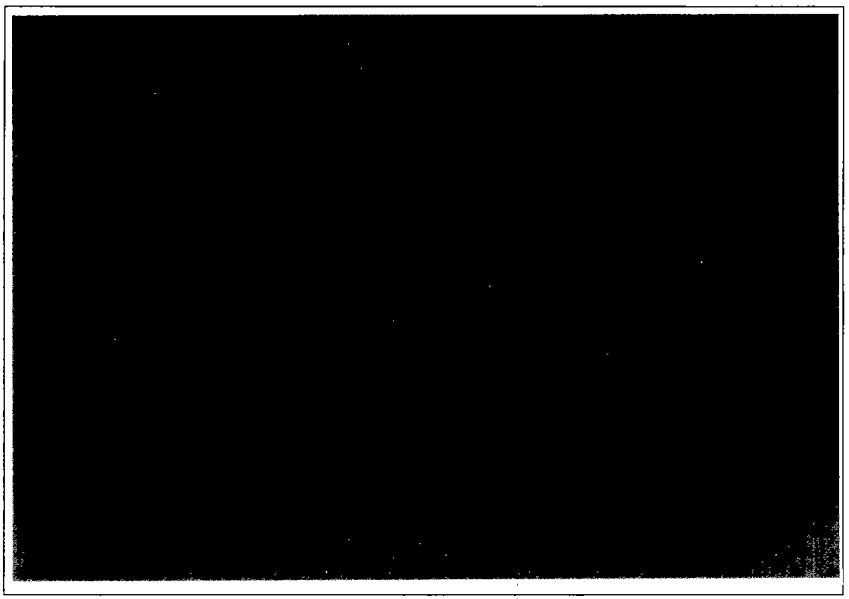

**Figure 3-1118**


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## 7. Grid Test Print (PGTYPE=6)

With the grid test print, you can mainly check color displacement, angle, and linearity.

**a. Color Displacement**

If color displacement occurs, suspect the transfer drum sheet.

Even if color displacement occurs on a test print, the black text processing mechanism at work in normal copying mode may correct it so that the problem may be absent on copies. The problem may be ignored if it does not appear on normal copies; keep in mind that this test print is used to identify the point of color displacement and the color when color displacement is noted on regular copies.

**b. Angle and Linearity**

If a angle or linearity problem is noted, suspect displaced laser beam or BD.

**Caution:**

You can specify mono or 3-color mode in user mode.

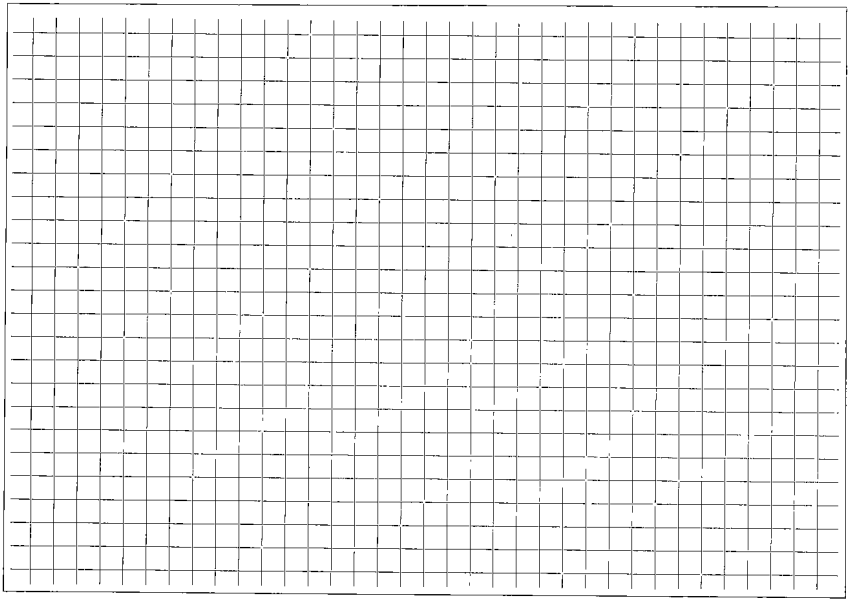

**Figure 3-1119**

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## 8. YMCBk 64-Gradation Test Print (PGTYPE=12)

With the YMCBk 64-gradation test print, you can check each of the colors (YMCBk) at a glance.

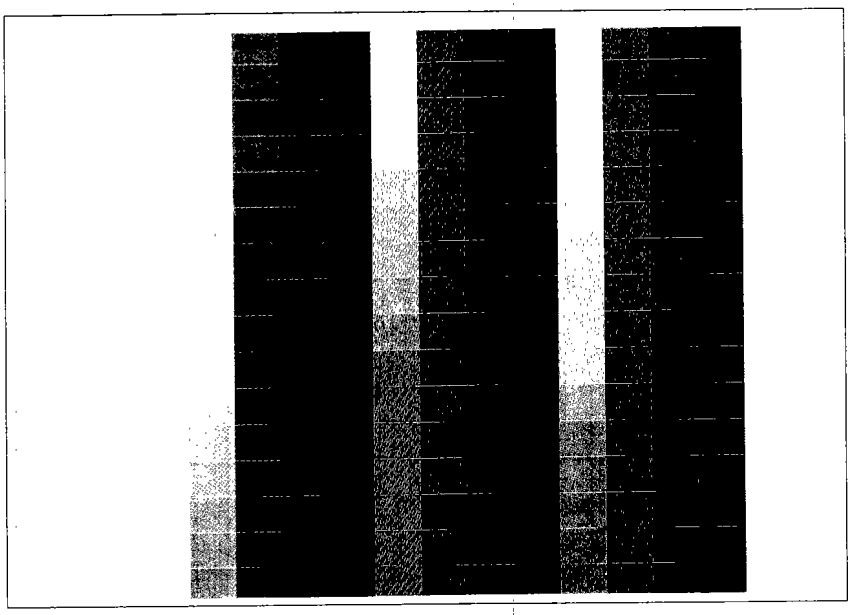

Figure 3-1120


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## 9. BGR 64-Gradation Test Print (PGTYPE=13)

With the BGR 64-gradation test print, you can mainly check the gray balance and the gradation of each of the colors (2-color; BGR).

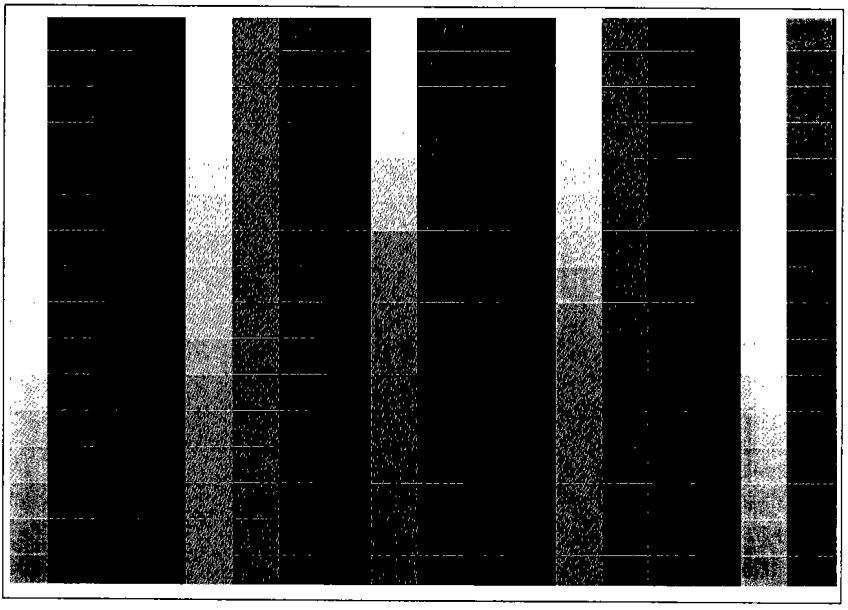

Figure 3-1121

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## 10. Full-Color 16-Gradation (YMCBk) Test Print (PGTYPE=14)

With the full-color 16 gradation (YMCBk) test print, you can mainly check the gray balance, gradation of each mono color (YMCBk), and fogging.

**a. Gray Balance**

Check if each color has uniform density in the gray scale area.

Use the contrast potential for adjustments.

**b. Gradation**

Check the density difference and gradation of each mono color (YMCBk).

**c. Fogging**

If the white area has fogging, suspect the developing system, photosensitive drum, and laser adjustment.

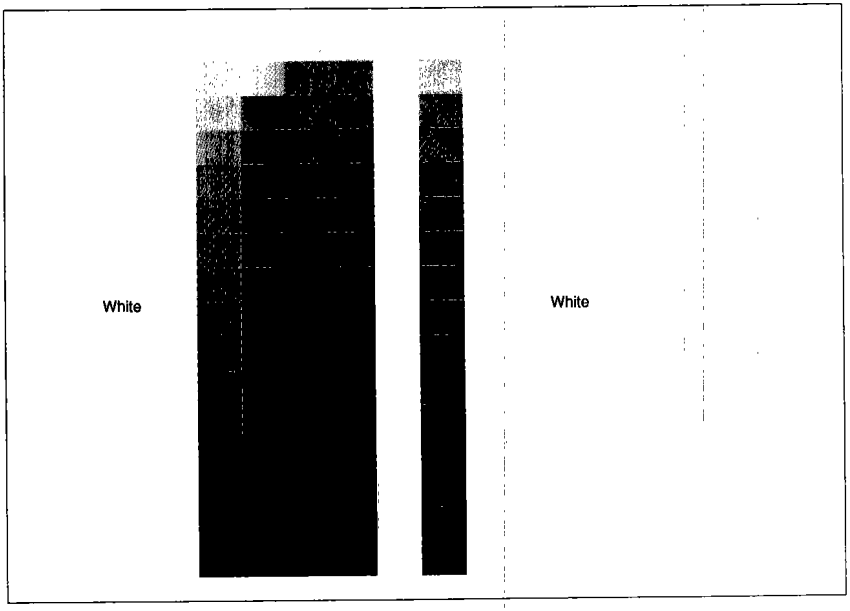


Figure 3-1122

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## 11. Full-Color Light Area 16-Gradation (YMCBk) Test Print (PGTYPE=15)

With this test print, you can check the gray balance of the light area or the gradation of each mono color (YMCBk) with more ease than PGTYPE=14.

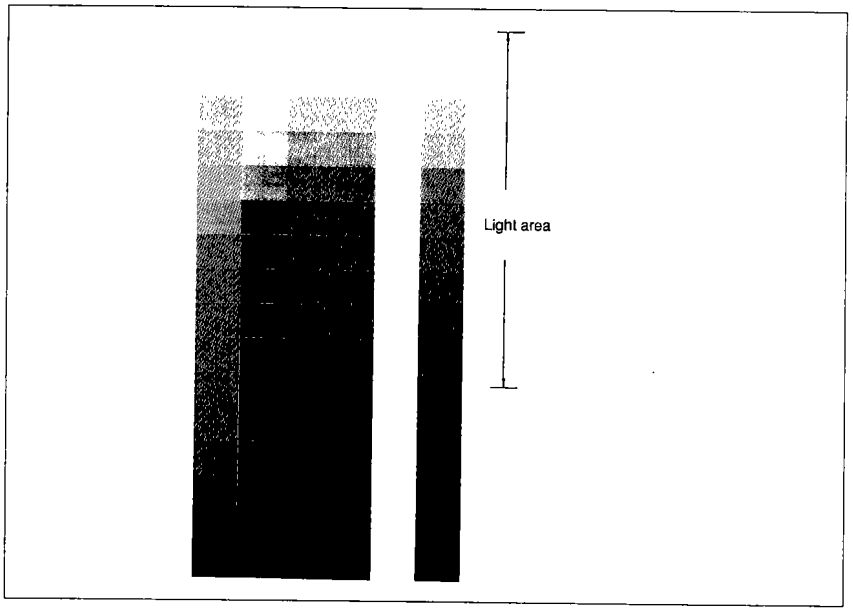


**Figure 3-1123**

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# XII. SELF DIAGNOSIS

The microprocessors on the image processor PCB and DC controller PCB are equipped with a self diagnosis mechanism that checks the condition of the copier (sensors, in particular) as needed and indicates a code on the control panel to identify the error.

Go through the table for the description of each code and when checks are made; the codes within a code provide detailed description and may be checked in 'JAM/ERROR' under 'DISPLAY' of service mode.

| Code | Cause | Description | |
|---|---|---|---|
| E000 | See descriptions under each classification that follows. | xx represents a heater.<br>xx=01: upper heater<br>xx=02: lower heater | |
| | Fixing thermistor (short circuit)<br>SSR (short circuit)<br>DC controller PCB (faulty) | xx0x | Overheating error |
| | | xx01 | The overheating detection circuit on the DC controller PCB has detected an abnormal rise in temperature (220°C or more). |
| | | xx02 | The thermistor has detected a temperature of 210°C or more. |
| | Fixing thermistor (poor contract, open circuit)<br>Fixing heater (open circuit)<br>SSR (faulty)<br>DC controller PCB (faulty) | xx1x | The heater does not turn on normally in response to the heater ON command. |
| | | xx2x | The temperature does not rise within a specific period of time when the temperature is controlled to 130°C or less. |
| | | xx21 | The temperature does not increase by 3°C or more in 4 min after the heater has turned on. |
| | | xx3x | The temperature does not rise within a specific period of time when the temperature is controlled to 130°C or more. |
| | | xx31 | During temperature control (after 130°C), an increase in temperature of 1° or more is not noted in 2 min after the heater has turned on. |
| | | xx32 | During temperature control (after 130°C), an increase in temperature of 5° or more is not noted in 3 min after the heater has turned on. |
| | | xx4x | An error has occurred, i.e., the temperature is below the specified value when it is controlled during standby. |
| | | xx5x | An error has occurred, i.e., the temperature is below the specified value when it is controlled during printing operation. |

**Table 3-1201**


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| Code | Cause | Description | |
|---|---|---|---|
| E004 | SSR (short circuit) | 0001 | The SSR is on even though the microprocessor on the DC controller PCB has turned off the SSR drive signal for the fixing heater. |
| | | 0002 | The SSR is on even though the microprocessor on the DC controller PCB has turned off the SSR drive signal for the cassette heater/drum heater. |
| E005 | • Cleaning belt (inside the fixing assembly; taken up)<br>• Cleaning belt length sensor (PS10; faulty)<br>• DC controller PCB (faulty) | As many as 2000 copies have been made since a warning has been issued in response to detection of the cleaning belt lever by the cleaning belt length sensor. | |
| E006 | • Fixing assembly drawer connector (faulty)<br>• DC controller PCB (faulty) | The connect signal 'CONNECT' of the fixing drawer connector has gone '0'. | |
| E008 | • Oil pump drive solenoid (SL12; faulty)<br>• Fixing oil level sensor (PS9; faulty)<br>• Oil supply path (faulty)<br>• Fixing oil (inadequate) | The presence of oil is not detected when 100copies have been made after the fixing oil level sensor detected the absence of oil and indecated a massage. | |
| E010 | • Main drive system (overload)<br>• Main motor (M4; faulty)<br>• DC controller PCB (faulty) | The main motor ready signal (M4RDY*) is '1' for 0.5 sec or more while the main motor is rotating. | |
| E012 | • Drum home position sensor (PS38; faulty)<br>• DC controller PCB (faulty) | 0001 | • The drum home position signal (PGHP) is not generated within 4 sec after the drum motor drive signal has been generated.<br>• The drum home position signal (PGHP) is generated within 2 sec after the drum motor drive signal has been generated. |
| | • Drum drive system (overload)<br>• Drum motor (error)<br>• DC controller PCB (faulty) | 0002 | The drum motor ready signal (M2RDY) is '1' for 0.5 sec or more while the drum motor is rotating. |

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| Code | Cause | Description | |
|---|---|---|---|
| E013 | • Waste toner feeding screw (error)<br>• DC controller PCB (faulty) | The detecting switch (MS4) is pressed after the waste toner feeding screw has become unable to rotate. | |
| E014 | • Fixing motor (M5; error)<br>• DC controller PCB (faulty) | The clock pulses of the fixing motor cannot be detected. | |
| E015 | • Pick-up motor (M6; error)<br>• DC controller PCB (faulty) | The clock pulses of the pick-up motor cannot be detected. | |
| E016 | • Photosensitive drum cleaner reciprocating motor (M9; faulty)<br>• DC controller PCB (faulty) | The photosensitive drum cleaner reciprocating motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more. | |
| E020 | See descriptions under each classification that follows. | Toner Density Error<br>xx represents the color of the developing assembly.<br>xx=00: MCYBk in common<br>xx=01: M<br>xx=02: C<br>xx=03: Y<br>xx=04: Bk<br>In the descriptions, the notation SGNL refers to the toner density signal and REF, reference signal. | |
| | • Toner density sensor (faulty)<br>• Stirring (developer, inside the developing assembly)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open)<br>• Photosensitive drum (deterioration) | xx00 | The connector has disengaged.<br>The value of 'REF' is '50' or lower |
| | | xx10 | At Time of Setting Initial Data (e.g., installation)<br>The variation of M-SGNL, C-SGNL, and Y-SGNL is '41' or more or the variation of K-SGNL is '102' or more when sampling the density data 10 times. |
| | | xx11 | At Time of Setting Initial Data (e.g., installation)<br>The variation of M-REF, C-REF, any-REF is '41' or more or the variation of K-SGNL is '102' or more when sampling the density data 10 times. |

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| Code | Cause | Description | |
|---|---|---|---|
| E020 | • Toner density sensor (faulty)<br>• Stirring (developer, inside the developing assembly)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open)<br>• Photosensitive drum (deterioration) | xx20 | At Time of Setting Initial Data (e.g., installation)<br>The variation of M-SGNL, C-SGNL, and Y-SGNL is '41' or more when sampling the density data 100 times or the variation of K-SGNL is '102' or more when sampling the density data 10 times. |
| | | xx21 | At Time of Setting Initial Data (e.g., installation)<br>The variation of M-REF, C-REF, and Y-REF is '41' or more when sampling the density data 100 times or the variation of K-REF is '102' or more when sampling the density data 340 times. |
| | | xx30 | At Time of Setting Initial Data (e.g., installation)<br>The value of M-SGNL, C-SGNL, and Y-SGNL that has been averaged after sampling is '777' or less or the value of K-SGNL is '163' or less. |
| | | xx31 | At Time of Setting Initial Data (e.g., installation)<br>The value of M-REF, C-REF, and Y-REF that has been averaged after sampling is '144' or less or the value of K-REF is '777' or less. |
| | | xx32 | At Time of Setting Initial Data (e.g., installation)<br>The value of SGAIN-M/-C/-Y/-K is '0'. |
| | | 0433 | At Time of Setting Initial Data (e.g., installation)<br>The value of REFG-K is '0'. |
| | | xx40 | At Time of Setting Initial Data (e.g., installation)<br>The value of M-SGNL, C-SGNL, and Y-SGNL that has been averaged after sampling is '859' or more or the value of K-SGNL is '410' or more. |

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| Code | Cause | Description | |
|---|---|---|---|
| E020 | • Toner density sensor (faulty)<br>• Stirring (developer, inside the developing assembly)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open)<br>• Photosensitive drum (deterioration) | xx41 | The value of M-REF, C-REF, and Y-REF that has been averaged after sampling is '920' or more or the value of K-REF is '859' or more. |
| | | xx42 | At Time of Setting Initial Data (e.g., installation)<br>The value of SGAIN-M/-C/-Y/-K is '255'. |
| | | 0443 | At Time of Setting Initial Data (e.g., Installation)<br>The value of REFG-K is '255'. |
| | • Toner density sensor (faulty)<br>• Stirring (developer, inside the developing assembly)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open) | xx50 | At Time of Setting Initial Data (e.g., installation)<br>The gain cannot be set. (No target value exists for 'SGNL' between 'GAIN: 20H' and 'GAIN: E0'.) |
| | | 0451 | At Time of Setting Initial Data (e.g., installation)<br>The gain cannot be set. (No target value exists for 'REF' between 'GAIN: 20H' and 'GAIN: E0'.) |
| | • Black toner density sensor window (dirt, scratches), Protection sheet (dirt)<br>• Photosensitive drum (dirt, cleaning failure) | 0460 | At Time of Multiple Initial Rotation (e.g., at power-on)<br>The window soiling correction value is 75% or below the specified value. |
| | | 0470 | At Time of Multiple Initial Rotation (e.g., at power-on)<br>The window soiling correction value is 125% or more of the specified value. |
| | DC controller PCB (backup data error; be sure to clear the RAM, and enter the setting recorded on the Service Label)<br>Initial settings (not made) | xx80 | During a copying sequence, the value of M-SGNL, C-SGNL, or Y-SGNL is '777' or less or the value of K-SGNL is '163' or less because of an error in the memory backup data. |
| | | xx81 | During a copying sequence, the value of M-RFF, C-REF, or Y-REF (initial settings) is '144' or less or the value of K-REF is '777' or less because of an error in the memory backup data. |

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| Code | Cause | Description | |
|---|---|---|---|
| E020 | DC controller PCB (backup data error; be sure to clear the RAM, and enter the setting recorded on the Service Label) Initial settings (not made) | xx82 | During a copying sequence, the value of SGAIN-M/-C/-Y/-K is '0' because of an error in the memory backup data. |
| | | 0483 | During a copying sequence, the value of REFG-K is '0' because of an error in the memory backup data. |
| | | xx90 | During a copying sequence, the value of M-SGNL, C-SGNL, or Y-SGNL (initial settings) is '859' or more or the value of K-SGNL is '470' because of an error in the memory backup data. |
| | | xx91 | During a copying sequence, the value of M-REF, C-REF, or Y-REF (initial settings) is '920' or more or the value of K-REF is '859' or more because of an error in the memory backup data. |
| | | xx92 | The value of SGAIN-M/-C/-Y/-K is '255' because of an error in the memory back-up data. |
| | | 0493 | During a copying sequence, the value of REFG-K is '255' because of an error in the memory backup data. |
| | • Developer (deterioration)<br>• Developing cylinder (fails to rotate)<br>• Developing assembly (fails to engage)<br>• Toner density sensor (faulty)<br>• developer (inside the developing assembly; stirring fault)<br>• Toner level sensor (faulty)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open)<br>• Photosensitive drum (deterioration) | xxA0 | During a copying sequence, the variation in the values of M-SGNL, C-SGNL, Y-SGNL, and K-SGNL is '102' or more when sampling the data 10 times. |
| | | xxA1 | During a copying sequence, the variation in the values of M-REF, C-REF, Y-REF, and K-REF is '102' or more when sampling the data 10 times. |
| | | xxB0 | During a copying sequence, the average of the values of M-SGNL, C-SGNL, Y-SGNL is '306' or less or the value of K-SGNL is '102' or less after sampling the data. |
| | | xxB1 | During a copying sequence, the value of REF dropped from the initial setting by 30% or more. |

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| Code | Cause | Description | |
|---|---|---|---|
| E020 | • Developer (deterioration)<br>• Developing cylinder (fails to rotate)<br>• Developing assembly (fails to engage)<br>• Toner density sensor (faulty)<br>• developer (inside the developing assembly; stirring fault)<br>• Toner level sensor (faulty)<br>The following applies to Bk only:<br>• Stray light (to the sensor assembly; cover absent, front door open)<br>• Photosensitive drum (deterioration) | xxC0 | During a copying sequence, the average of the values of SGNL-M, SGNL-C, SGNL-Y is '1013' or more or the value of SGNL-K is '550' or more when sampling the data. |
| | | xxC1 | During a copying sequence, the value of REF has risen from the initial setting by 30% or more. |
| | | xxD0 | During a copying sequence, the value of SGNL remained -3% or more than the initial setting while 20 copies (Large size) were made continuously. |
| | | xxE0 | During a copying sequence, the value of SGNL remained +3% or more than the initial setting while 20 copies (Large size) are made continuously. |
| | | 00F0 | The hopper motor drive circuit has detected an overcurrent for 0.7 sec or more. |
| E030 | • Counter (open circuit)<br>• DC controller PCB | Make a check immediately before the counter turns on and off; normal if the counter drive signal is '0' when the counter turns on or if the counter drive signal is '1' when the counter turns off. | |
| E032 | • Copy Data Controller-related error | The counter or the like of the Copy Data Controller-A1 does not operate. | |
| E050 | Duplexing Unit<br>• Connector (disconnected)<br>• Sensor (faulty)<br>• Motor (faulty) / Belt (torn)<br>• DC controller PCB (faulty) | A specific fault is detected at the start of two-sided copying. | |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | Potential Control Fault<br>Higher 2 Digits<br>xx=00: MCYBk in common<br>xx=01: M<br>xx=02: C<br>xx=03: Y<br>xx=04: Bk | |
| | | xx00 | The computed value of V00 for the 1st rotation is below the lower limit (100V). |
| | | xx01 | The computed value of V00 for the 1st rotation is above the upper limit (900V). |
| | | xx02 | The computed value of VFF for the 1st rotation is below the lower limit (10V). |
| | | xx03 | The computed value of VFF for the 1st rotation is above the upper limit (800V). |
| | | xx04 | The computed value of the grid bias for the 1st rotation is below the lower limit (200V). |
| | | xx05 | The computed value of the grid bias for the 1st rotation is above the upper limit (900V). |
| | | xx06 | The computed value of the developing bias for the 1st rotation is below the lower limit (200 v). |
| | | xx07 | The computed value of the developing bias for the 1st rotation is above the upper limit (700V). |
| | | xx08 | The computed value of the V00 for the 2nd rotation is below the lower limit (100V). |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | xx09 | The computed value of V00 for the 2nd rotation is above the upper limit (900V). |
| | | xx0A | The computed value of VFF for the 2nd rotation is below the lower limit (10V). |
| | | xx0B | The computed value of VFF for the 2nd rotation is above the upper value (800V). |
| | | xx0C | The computed value of the grid bias for the 2nd rotation is below the lower limit (200V). |
| | | xx0D | The computed value of the grid bias for the 2nd rotation is above the upper limit (900V). |
| | | xx0E | The computed value of the developing bias for the 2nd rotation is below the lower limit (200V). |
| | | xx0F | The computed value of the developing bias for the 2nd rotation is above the upper limit (700V). |
| | | 001x: Inadequate primary corona assembly output | |
| | | 0010 | The photosensitive drum surface potential V is below the lower limit (20V) for the 1st rotation when laser output voltage=V00, grid bias=300V, –500V, and =700V. |
| | | 0011 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when laser output voltage=V00 and grid bias=300V. |
| | | 0012 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=500V. |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | 0013 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V. |
| | | 0018 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V. |
| | | 0019 | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=300V. |
| | | 001A | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (20V) when the laser output voltage=V00 and the grid bias=500V. |
| | | 001B | When the photosensitive drum surface potential V for the 2nd rotation is blow the lower limit (20V) when the laser output voltage=V00 and the grid bias=700V. |
| | | 002x: Grid bias output fault (primary corona assembly) | |
| | | 0020 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias is =300V, =500V, and =700V. |

| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | 0021 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V100 and the grid bias =300V. |
| | | 0022 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=100 and the grid bias=500V. |
| | | 0023 | The photosensitive drum surface potential V for the 1st rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=700V. |
| | | 0028 | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V. |
| | | 0029 | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=300V. |
| | | 002A | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=500V. |
| | | 002B | The photosensitive drum surface potential V for the 2nd rotation is below the lower limit (100V) when the laser output voltage=V00 and the grid bias=700V. |
| | | 003x: primary corona assembly grid wire broken | |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | 0030 | The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V. |
| | | 0031 | The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias =300V. |
| | | 0032 | The photosensitive drum surface potential V for the 1st rotation is above the upper value (900 V) when the laser output voltage=V00 and the grid bias=500V. |
| | | 0033 | The photosensitive drum surface potential V for the 1st rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=700V. |
| | | 0038 | The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V, =500V, and =700V. |
| | | 0039 | The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=300V. |
| | | 003A | The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=500V. |
| | | 003B | The photosensitive drum surface potential V for the 2nd rotation is above the upper limit (900V) when the laser output voltage=V00 and the grid bias=700V. |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | 004x: primary corona grid wire, primary corona wire, and pre-exposure lamp faulty; connector poor contact | |
| | | 0040 | For the 1st rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=300V and the photosensitive surface potential V when the grid bias=500V is below the lower limit (50V). |
| | | 0041 | For the 1st rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=500V and the photosensitive surface potential V when the grid bias=700V is below the lower limit (50V). |
| | | 0048 | For the 2nd rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=300V and the photosensitive surface potential V when the grid bias=500V is below the lower limit (50V). |
| | | 0049 | For the 2nd rotation with the laser output voltage=V00, the difference between the photosensitive drum surface potential V when the grid bias=500V and the photosensitive surface potential V when the grid bias=700V is below the lower limit (50V). |
| | | 005x: inadequate laser intensity, laser unit fault, laser controller PCB faulty | |
| | | 0050 | For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=300V, =500V, and =700V with the laser output voltage=V00 and =VFF. |

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| Code | Cause | Description | |
|---|---|---|---|
| E061 | • Potential measuring unit (faulty)<br>• Primary corona assembly (faulty)<br>• HVDC (faulty)<br>• DC controller PCB (faulty)<br>• Laser unit (faulty)<br>• Laser shutter (faulty)<br>• Pre-exposure lamp (faulty)<br>• Environment sensor (faulty)<br>• Photosensitive drum (faulty)<br>• Photosensitive drum (faulty grounding) | 0051 | For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (50V) when the grid bias=300V with the laser output voltage=V00 and =VFF. |
| | | 0052 | For the 1st rotation, the difference in the photosensitive surface potential V is below the lower limit (80V) when the grid bias=500V with the laser output voltage=V00 and =VFF. |
| | | 0053 | For the 1st rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=700V with the laser output voltage=V00 and =VFF. |
| | | 0058 | For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=300V, =500V, and =700V with the laser output voltage=V00 and =VFF. |
| | | 0059 | For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (50V) when the grid bias=300V with the laser output voltage=V00 and =VFF. |
| | | 005A | For the 2nd rotation, the difference in the photosensitive surface potential V is below the lower limit (80V) when the grid bias=500V with the laser output voltage=V00 and =VFF. |
| | | 005B | For the 2nd rotation, the difference in the photosensitive drum surface potential V is below the lower limit (100V) when the grid bias=700V with the laser output voltage=V00 and =VFF. |
| | | 006x: Potential sensor faulty or potential sensor not adjusted | |
| | | 0060 | The potential offset value is below the specified value (80V). |
| | | 0061 | The potential offset value is above the specified value (120V) |

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| Code | Cause | Description | |
|---|---|---|---|
| E071 | • Side A sensor (PS2; faulty)<br>• Side B sensor (PS3; faulty)<br>• Drum motor drive system (overload)<br>• DC controller PCB (faulty)<br>• Transfer drum (faulty engagement) | 0001 | No change is detected within 10 sec after the side A image leading edge signal (ITOP-A) has engaged the transfer drum. |
| | | 0002 | No change is detected within 10 sec after the side B image leading edge signal (ITOP-B) has engaged the transfer drum. |
| | | 0003 | The period from the side A image leading edge signal (ITOP-A) to the side A image leading edge signal (ITOP-A) is shorter by 0.3 sec (or more) than the specified value (transfer drum rotation = 4.25 sec). |
| | | 0004 | The period from the side A image leading edge signal (ITOP-A) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than he specified value (transfer drum 0.5 rotation = 2.125 sec). |
| | | 0005 | The period from the side B image leading edge signal (ITOP-B) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than the specified value (transfer drum rotation = 4.25 sec). |
| | | 0006 | The period from the side A image leading edge signal (ITOP-A) to the side B image leading edge signal (ITOP-B) is shorter by 0.3 sec (or more) than the specified value (transfer drum 0.5 rotation = 2.125 sec). |
| E072 | • Transfer drum cleaner drive system (overload)<br>• Transfer drum cleaner motor (M10; faulty)<br>• DC controller PCB (faulty) | 0101 | The transfer drum cleaner motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more. |
| | • Brush drive motor (M11; faulty)<br>• DC controller PCB (faulty) | 0201 | The brush drive motor drive circuit on the DC controller PCB has detected an overcurrent for 0.1 sec or more. |

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| Code | Cause | Description | |
|---|---|---|---|
| E072 | • Brush drive motor home position sensor (PS7; faulty)<br>• Brush drive motor (M11; faulty)<br>• DC controller PCB (faulty) | 0202 | • The brush drive motor home positions signal (BMTRHP) is not generated within 4 sec after the brush drive motor drive signal has been generated. |
| E073 | • Transfer drawer connector (faulty)<br>• DC controller PCB (faulty) | 0001 | The connect signal CONNECT for the transfer assembly frame drawer has gone '0'. |
| | | 0002 | The connect signal CONNECT for the transfer drawer connector has gone '0'. |
| E100 | • Laser unit (faulty)<br>• Laser driver PCB (faulty)<br>• Image processor PCB (faulty) | The BD signal cannot be detected for 1 sec or more when potential control is started. | |
| E110 | • Laser scanner drive system (overload)<br>• Laser scanner motor (M3; faulty)<br>• DC controller PCB (faulty) | The laser scanner motor ready signal (LSMRDY*) is '1' for 0.5 sec or more while the laser scanner motor is rotating. | |
| E190 | The laser scanner motor ready signal (LSMRDY*) is '1' for 0.1 sec or more while the laser scanner motor is rotating. | cccc | Normal |
| | | xxxx | The RAM access to the laser controller PCB when the power switch is turned on is not normal (80xxxxH). |
| E208 | • DC power supply (to the scanner motor driver PCB; faulty)<br>• Wiring, connector (faulty)<br>• Scanner motor driver PCB (faulty)<br>• Reader controller PCB (faulty) | The communication between the scanner motor driver PCB and the reader controller PCB has remained off for 5 sec or more. | |

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| Code | Cause | Description |
|---|---|---|
| E220 | Scanning lamp (error)<br>• Lamp regulator PCB (faulty) | • During standby, the scanning lamp has turned on even though the reader controller PCB has turned off the scanning lamp on signal.<br>• During copying, the scanning lamp has turned off even though the DC controller PCB has turned on the scanning lamp on signal. |
| E305 | • IP-MAIN PCB (faulty)<br>• IP-PRJ PCB (faulty)<br>• EP-eD PCB (faulty)<br><br>For details, see Table 3-1104. | • RAM access failed on the IP-MAIN PCB at power-on.<br>• RAM access on the IP-PRJ PCB or the IP-ED PCB has failed. (E305 is indicated at the start of copying in projector or area designation mode.) |
| E350 | • Bar code (faulty, not attached)<br>• Image processor PCB (faulty) | When the copier checked the presence/absence of a bar code label on the standard white plate before making the first copy after power-on, it has failed to detect the bar code. |
| E351 | • IP-MAIN PCB (faulty)<br>• IP-ECO PCB (faulty)<br>• IP-MAIN, IP-ECO, laser driver (contact fault) | • The IP-ECOPC and the IP-MAIN PCB are not connected.<br>• The IP-ECO PCB and the ROM are not compatible. |
| E352 | • Bar code label (faulty or absent) | • The bar code on the standard white plate cannot be read when 'WSMP' is executed in service mode. |
| E620 | • IP-ED PCB (faulty)<br>• IP-MAIN PCB (faulty) | The communication between the IP-ED PCB and the IP-MAIN PCB has remained off for 5 sec or more. |
| E633 (TYPE1)<br>E718 (TYPE2) | • IP-PRJ PCB (faulty)<br>• IP-MAIN PCB (faulty)<br>• Film projector controller PCB (faulty) | The communication between the film projector and the IP-MAIN PCB has remained off for 5 sec or more. |
| E634 | • Film projector lamp (faulty) | See the Service Manual for the film projector. |

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| Code | Cause | Description |
|---|---|---|
| E700 | • DC controller PCB (faulty)<br>• Reader controller PCB (faulty)<br>• Power supply PCB (faulty) | The communication between the DC controller PCB and the reader controller PCB has remained for 5 sec or more. |
| E717 | • Copy Data Controller A1-related error | The Copy Data Controller has been physically disconnected. |
| E800 | • Power switch<br>• DC controller PCB<br>• DC harness | A break in the auto shutoff signal has been detected. |
| E804 | • Power supply unit cooling fan (FM8) Error | The power unit cooling fan (FM8) has stopped to rotate. |

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**E305 in Detail**

| Detail code | Description | Detail code | Description |
|---|---|---|---|
| 0001 | BD error (same as E100) | 0100 | IP-ED PCB RAM error or not connected |
| 0002 | Density conversion RAM error | | |
| 0004 | B shading correction RAM error | 0400 | IP-PRJ PCB error or not connected |
| 0008 | G shading correction RAM error | 0800 | IP-IF PCB RAM error |
| 0010 | R shading correction RAM error | 1000 | |
| 0020 | Color correction RAM error | | |
| 0040 | Scanning motor error | | |

**Table 3-1104**

**Reference:**

1. To reset the machine after self diagnosis, turn off the machine once.
   This, however, will not work for errors represented by 'E000'. This is to prevent damage to the fixing roller that would occur if the user were allowed to reset E000 errors without correcting the cause (thermistor, for example).
2. If 'E005" is noted indicating that the cleaning belt has been used up, replace the belt and execute 'E005-RLS' of 'FUSER' under 'FUNCT'.
3. You can check the data for the most recent E-indication after resetting the machine by turning it off using 'JAM/ERROR' under 'DISPLAY' of service mode.

**Clearing E000**

1) Activate service mode, and select 'FUSER' under 'FUNC'.
2) Press 'E000-RLS'.
3) Turn off and then on the power switch.

**Clearing E005**

1) Replace the cleaning belt.
2) Activate service mode, and select 'FUSER' under 'FUNC'.
3) Press 'E005-RLS'.
4) Turn off and then on the power switch.

**Clearing E008**

1) Supply fixing oil to the fixing oil case.
2) Turn off and then on the power switch.
   • Oil will be supplied automatically without clearing the 'E008'; the operation will end in about 10~15 min.
3) Turn off and then on the power switch.

**Clearing E717**

1) Activate service mode, and press 'B-CLR' of 'DATA-CON' under 'OPTION'. Or, clear the RAM on the reader controller PCB.

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## Self Diagnosis in RDFs

The microprocessor on the RF controller PCB is provided with a mechanism which automatically checks the state of the machine (sensors, in particular). When it identifies an error, it indicates the nature of the error on the copier's control panel in the form of a code.

| Code | Main Cause | Description |
|---|---|---|
| E400 | • Data communication (with copier) | • The communication is monitored at all times, and an error is identified when there is an interruption of 5 sec or more. |
| E401 | • Pick-up motor (M1; faulty)<br>• Pick-up roller home position sensor 1 (S8; faulty) | • The state of the sensor does not change when the pick-up motor has been driven for 2 sec or more. |
| E402 | • Belt motor (M3; faulty)<br>• Belt motor clock sensor (S11; faulty) | • The number of belt motor clock pulses is below a specific value for 100 ms. |
| E403 | • Reversing motor (M2; faulty)<br>• Slip sensor (S10; faulty) | • The number of slip clock pulses is below a specific value for 100 ms. |
| E404 | • Delivery motor (M5; faulty)<br>• Delivery motor clock sensor (S12; faulty) | • The number of delivery motor clock pulses is below a specific value for 200 ms. |
| E405 | • Pick-up motor (M1; faulty)<br>• Pick-up motor clock sensor (S9; faulty) | • The number of pick-up motor clock pulses is below a specific value for 200 ms. |
| E407 | • Tray up/down motor (M6; faulty)<br>• Tray position sensor (S25; faulty) | • The state of the sensor does not change when the tray up/down motor has been driven for 2 sec or more. |
| E408 | • Feeding motor (M8; faulty)<br>• Feeding motor clock sensor (S22; faulty) | • The number of feeding motor clock pulses is below a specific vaue for 100 ms. |
| E411 | • Registration sensor 1 (S3; faulty)<br>• Skew sensor 1 (S4; faulty)<br>• Manual registration sensor (S19; faulty)<br>• Image leading edge sensor (S20; faulty)<br>• Original sensor 1 (S1; faulty) | • The output of each sensor is more than a specific value in the absence of paper. |

**Note:**

1. When the self diagnosis mechanism has been activated, you may reset it by turning off the copier's power switch.
2. You may continue to make copies while the RF is out of order by opening the RF and placing the original on the copyboard glass.

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## Self Diagnosis in Sorters

| Code | Error | Description |
|---|---|---|
| E510 (10H) | • The feeding motor (M1) fails to rotate. | • The clock signal from the clock sensor (PI5) of the feeder motor is absent for 250 ms or more. |
| E516 (16H) | • The low-speed feeding motor (M10) fails to rotate. | • The clock sensor (PI23) of the low-speed feeding motor does not generate clock signals for 250 ms or more. |
| E517 (17H) | • The pressure cam of the buffer pass unit does not detect home position. | • The home position is not detected within a specific period of time* after a press on the Copy Start key. *Varies depending on the copier. |
| E522 (22H) | • The push bar motor (M7) fails to rotate. | • The operation does not end within 2000 ms after the motor drive signal has been generated. |
| E523 (23H) | • The reference wall motor (M6) fails to rotate. | • The operation does not end within 2000 ms after the motor drive signal has been generated. |
| E524 (24H) | • The multiple guide motor (M5) fails to rotate. | • The operation does not end within 2000 ms after the motor drive signal has been generated. |
| E525 (25H) | • The automatic adjustment mechanism for the bin inside paper sensor 1 (S3, S4) has failed. | • The bin inside paper sensor 1 (S3, S4) cannot be adjusted automatically or an error exists in the automatic adjustment value. |
| E526 (26H) | • The automatic adjustment mechanism for the bin inside paper sensor 2 (S6, S7) has failed. | • The bin inside paper sensor 2 (S6, S7) cannot be adjusted automatically or an error exists in the automatic adjustment value. |
| E530 (30H) | • The guide bar motor (M8) fails to rotate. | • The operation does not end within a specific period of time after the motor drive signal has been generated.<br>time: 5000 ms for front retrieval mode<br>2000 ms in other mode |

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| Code | Error | Description |
|---|---|---|
| E531 (31H) | • The stapler unit swing motor (M4) fails to rotate. | • The operation does not end within 2000 ms after the motor drive signal has been generated.<br>• The clock signal from the clock sensor (PI8) of the motor is absent for 250 ms or more.<br>• The input signal from the swing home position sensor (PI9) does not change for 1000 ms or more. |
| E532 (32H) | • The stapler unit drive motor (M3) fails to rotate. | • The operation does not end within 5000 ms after the motor drive signal has been generated. |
| E533 (33H) | • The automatic adjustment mechanism for the stapler inside paper sensor has failed. | • The stapler inside paper sensor cannot be adjusted automatically or an error exists in the automatic adjustment value. |
| E540 (40H) | • The bin drive motor (M9) fails to rotate. | • The operation does not end within a specific period of time after the motor drive signal has been generated.<br>time: 20000 ms for initialization<br>2000 ms for others<br>• The clock signal from the clock plate sensor of the motor is absent for 250 ms or more.<br>• The input signal from the lead cam position sensor (PI20) does not change for 2000 ms. |
| E550 (50H) | • The DC output from the sorter controller PCB is faulty. | • An error has occured in the DC output (24VL, 24VP) of the sorter controller PCB. |

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# I. EXTERNALS

## A. Covers

### 1. External Covers

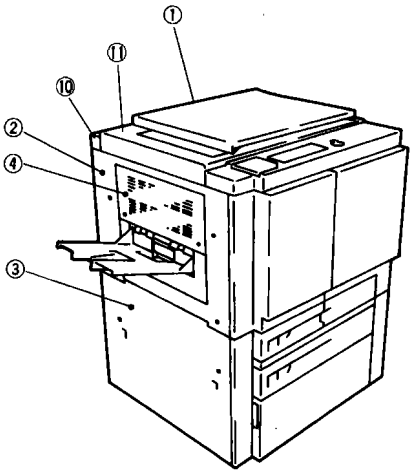


Figure 4-101 (a) (CLC700)

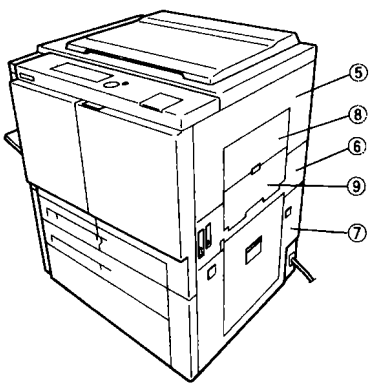


Figure 4-101 (b)

① Rear cover (5)
② Upper left cover (4)
③ Lower left cover (2)
④ Delivery upper cover (20)
⑤ Upper right cover (2)
⑥ Middle right cover (2)
⑦ Lower right cover (2)
⑧ Reader controller cover (2)
⑨ Multifeeder cover (2)
⑩ Upper rear cover (3)
⑪ Upper cover (11)

**Reference:**

The number in parentheses indicates the number of mounting screws used for the cover; note that the screw used to install the rear cover is equipped with a washer.

Remove the covers as necessary to clean, inspect, or repair the inside of the machine.

Those that can be removed by mere removal of the screws are omitted from the instructions.

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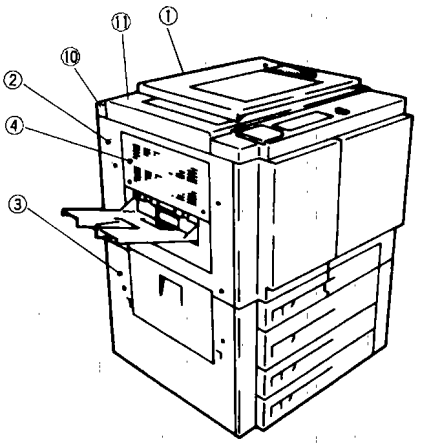


Figure 4-102 (a) (CLC800)

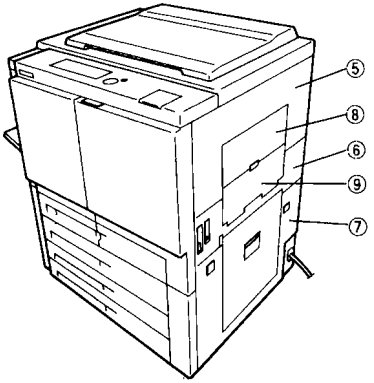


Figure 4-102 (b)

① Rear cover (5)
② Upper left cover (4)
③ Lower left cover (2)
④ Delivery upper cover (2)
⑤ Upper right cover (2)
⑥ Center right cover (2)
⑦ Lower right cover (2)
⑧ Reader controller cover
⑨ Multifeeder cover (2)
⑩ Upper rear cover (3)
⑪ Upper cover (11)

**Reference:**

The number in parentheses indicates the number of mounting screws used for the cover; note that the screw used to install the rear cover is equipped with a washer.

Remove the covers as necessary to clean, inspect, or repair the inside of the machine.

Those that can be removed by mere removal of the screws are omitted from the instructions.


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## 2. Inside Left Cover

1) Remove the four screws ①.

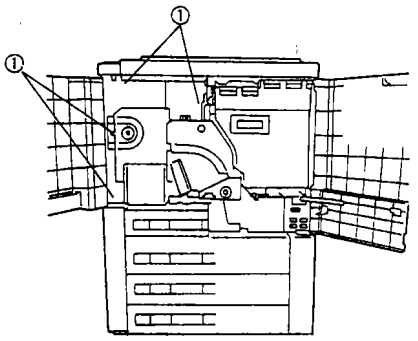


Figure 4-103

2) Slide out the transfer assembly frame, and remove the inside left cover.

## 3. Transfer Assembly Frame Cover

1) Remove the transfer drum rotating knob ①.
2) Remove the two screws ②, and remove the transfer frame cover ③.

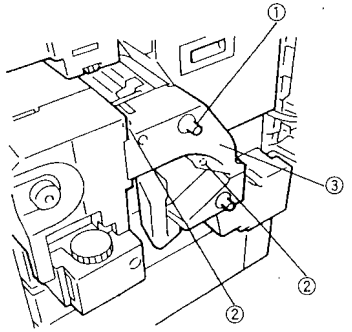


Figure 4-104

## 4. Fixing Assembly Cover

1) Remove the screw, and remove the fixing assembly knob ①.
2) Remove the two screws ②, and remove the fixing cover ③.

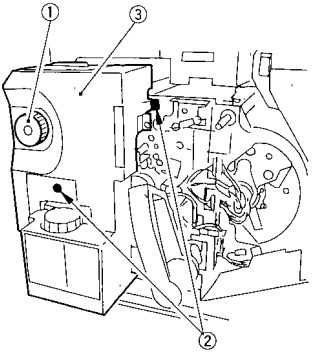


Figure 4-105

**Caution:**

Make sure that the hook at the bottom of the cover is properly fitted into the hole in the transfer assembly frame when attaching the fixing cover.

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## 5. Transfer Assembly Frame Right Cover

1) Pull out the registration roller rotating knob.
2) Remove the two screws ①, and remove the transfer frame right cover ②.

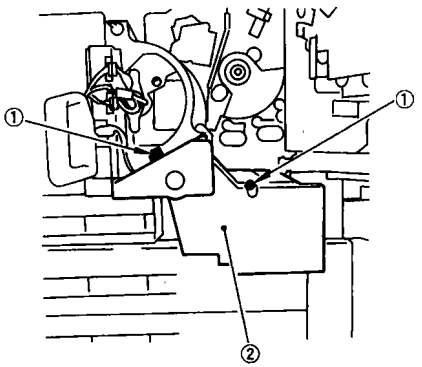


**Figure 4-106**

**Caution:**
Make sure that the hook at the bottom of the cover is properly fitted into the hole in the transfer frame when attaching the transfer assembly frame right cover.

## 6. Detaching the Copyboard Glass

1) Remove the two screws, and remove the copyboard glass (right).
2) Remove the copyboard glass by lifting its right end.

**Reference:**
Do not remove parts other than the copyboard glass retainer (right) when detaching the copyboard glass. When attaching it, take care so that it will not override the stop plate at the rear and front; butt it against the left rear when fixing it in place.

## 7. Detaching the Upper Cover

1) Remove the control panel.
2) Remove the copyboard glass.
3) Remove the three screws ① from the bottom of the control panel. (See Figure 4-108.)
4) Remove the three screws, and remove the rear upper cover.
5) Remove the two screws, and remove the vertical size plate.
6) Remove the face plates ② covering the projector screw holes using a flat-blade screwdriver.

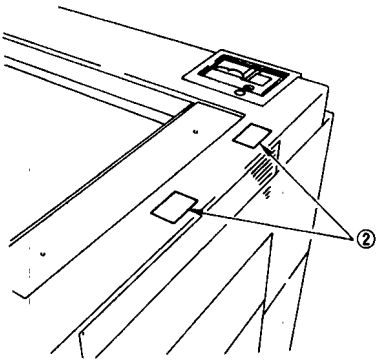


**Figure 4-107**

7) Remove the eight screws ③, and remove the upper cover ④.

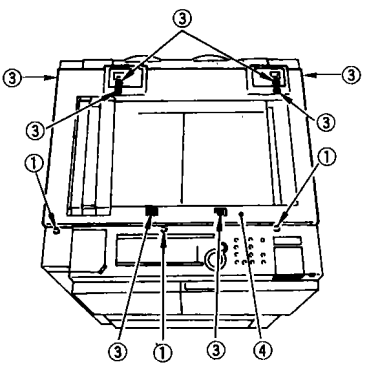


**Figure 4-108**


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# B. Control Panel

## 1. Detaching the Control Panel

1) Remove the four screws ①, and remove the control panel ②.

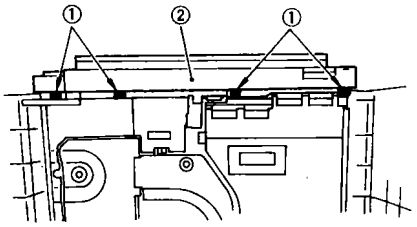


Figure 4-109

## 2. Detaching the Relay PCB

1) Remove the control panel, and turn it over.
2) Remove the harness (J5301) from the copier.
3) Disconnect the six connectors ① of the relay PCB (J5303, J5304, J5305, J5308, J5309, J5310).
4) Remove the five screws ②, and remove the extension control panel PCB, relay PCB, and grounding connecting plate ③.

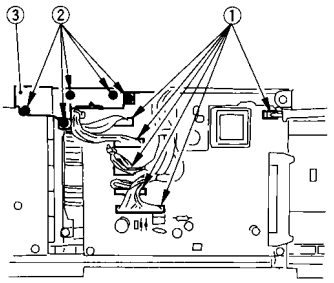


Figure 4-110

5) Remove the three fixing screws of the relay PCB.
6) Turn over the relay PCB.
7) Shift the fixing of the connector ④ of the flexible cable.
8) Pull out the flexible cable ⑤ carefully. (J5302, J5306).

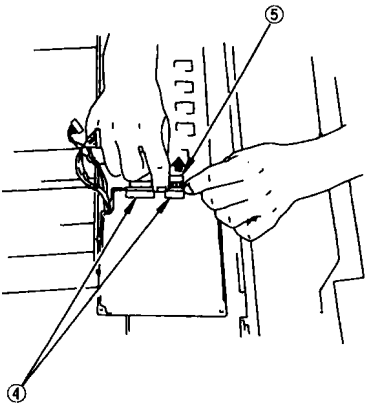


Figure 4-111

## 3. Detaching the LCD PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the LCD PCB ②, keypad PCB ③, and grounding connecting plate ④.

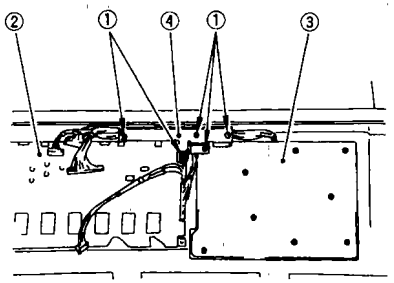


Figure 4-112

3) Remove the three screws, and remove the LCD PCB.

## 4. Detaching the Extension Control Panel PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the extension control panel PCB ②.

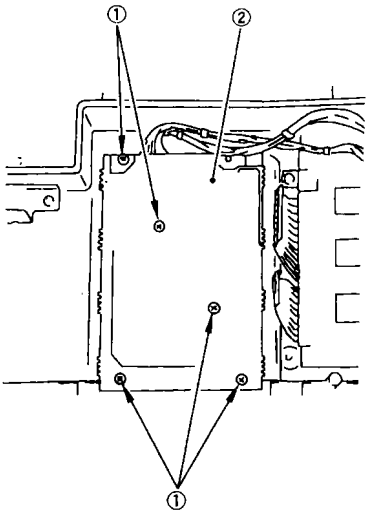


Figure 4-113

## 5. Detaching the Keypad PCB

1) Remove the relay PCB.
2) Remove the five screws ①, and remove the LCD PCB ②, keypad PCB ③, and grounding connecting plate ④.

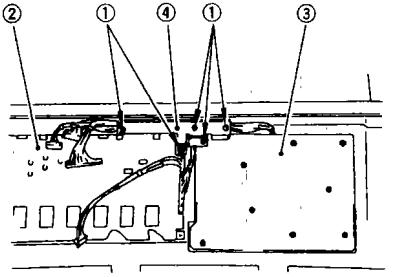


Figure 4-114

3) Remove the nine screws ⑤, and remove the keypad PCB ⑥.

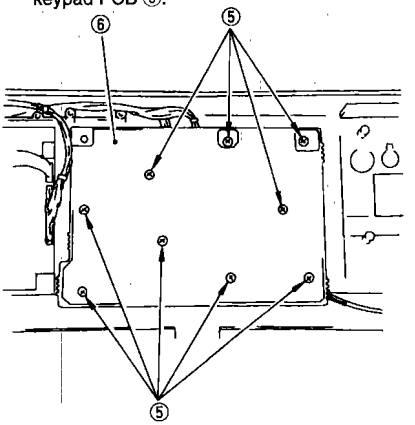


Figure 4-115

4) Remove the connecting harness connecting to the pilot lamp. (J5003)


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## C. Flywheel

### 1. Detaching the Flywheel

**Caution:**
The copier's three flywheels ① weigh 30 kg in total, each weighing 10 kg.
Take adequate care not to drop them; support them as shown in Figure 4-116.

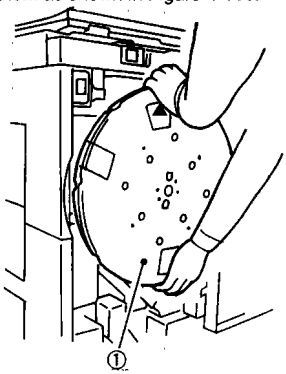


**Figure 4-116**

1) Remove the rear cover.
2) Remove the two screws ①, and remove the flywheel 1 ②.

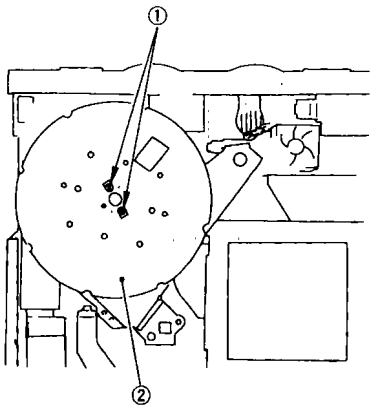


**Figure 4-117**

3) Remove the two screws, and remove the flywheel 2.
4) Remove the two screws ③, and remove the flywheel 3 ④.

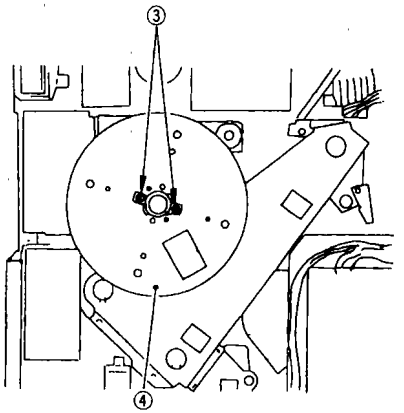


**Figure 4-118**

### 2. Points to Note When Attaching the Flywheel

- The flywheels 1, 2, and 3 have their own orientation; pay attention to their face and back, and install them so that the 10 kg label is in view.
- Put the flywheels 2 and 1 together so that the cut-outs will be positioned over mounting screws.

# D. Fans

## 1. Outline

The copier is equipped with 14 fan motors to drive the fans, thereby circulating the air inside the machine and preventing overheating; the information that follows is limited to the major fans.

## 2. Primary Corona Assembly Fan (FM2)

The primary corona assembly fan unit q consists of two fans (large. small), and air filters.

**a. Detaching the Air Filter**

1) Remove the rear cover.
2) Remove the flywheels 1 and 2.
3) Remove the fan cover ①; then, remove the air filter ②.

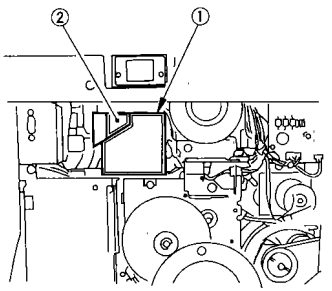


Figure 4-119

**Caution:**
You may remove the fan cover while lifting the top (see arrow) to facilitate the work.

**b. Detaching the Primary Corona Assembly Fan (large; ③)**

1) Remove the air filter.
2) Remove the upper rear cover.
3) Remove the three screws ④, and disconnect the connector ⑤; then, pull out the fan.

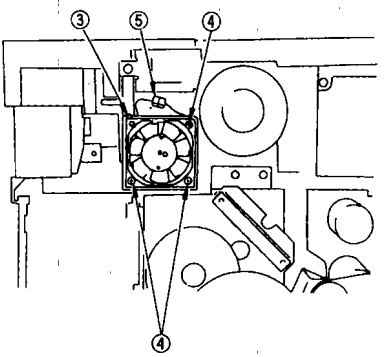


Figure 4-120

**c. Detaching the Primary Corona Assembly (small; ⑥)**

1) Remove the primary corona assembly fan (large).
2) Remove the four screws ⑦, and disconnect the connector ⑧; remove the fan together with its duct.

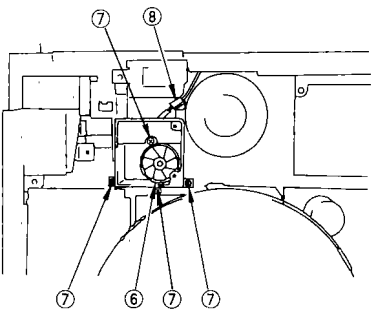


Figure 4-121

3) Remove the two screws, and remove the primary charging assembly fan (small) from the duct.


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**d. Points to Note When Attaching the Primary Corona Assembly Fan (large)**

**Caution:**
Be sure to install the primary corona assembly fan (large) carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

## 3. Fixing Assembly Heat Exhaust Fan (FM3)

**a. Detaching the Fixing Assembly Heat Exhaust Fan ①**

1) Remove the rear cover.
2) Remove the ozone filter.
3) Remove the two screws ②, and disconnect the connector ③; then, pull out the fan from the duct.

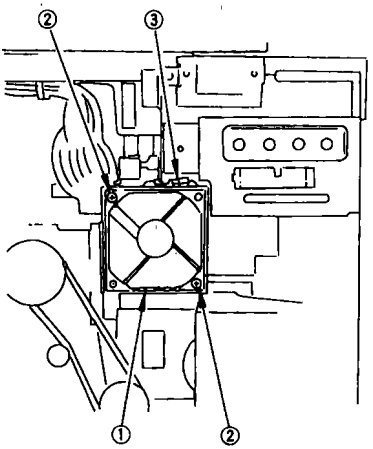


**Figure 4-122**

**b. Points to Note When Attaching the Fixing Assembly Heat Exhaust Fan**

**Caution:**
Be sure to install the fixing assembly heat exhaust fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

## 4. Ozone Exhaust Fan 1 (FM4)

**a. Detaching the Ozone Filter**

1) Remove the rear cover.
2) Remove the ozone filter ①.

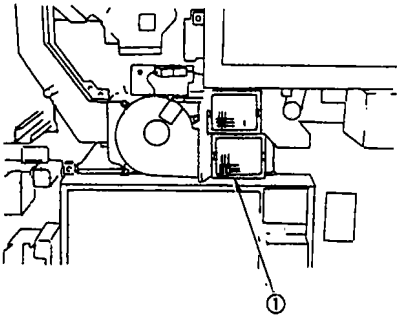


**Figure 4-123**

**b. Detaching the Ozone Exhaust Fan 1**

1) Remove the rear cover.
2) Remove the three screws ②, and disconnect the connector ③; then, remove the ozone exhaust fan ④.

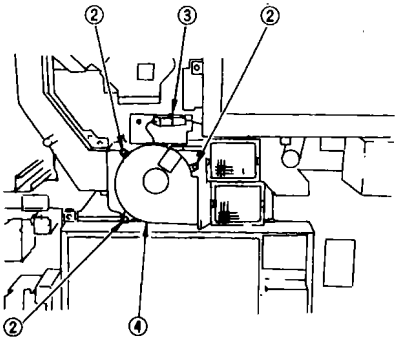


**Figure 4-124**

**c. Detaching the Air Filter of the Ozone Exhaust Fan 1**

1) Remove the rear cover.
2) Remove the ozone exhaust fan 1.
3) Remove the air filter ⑤.

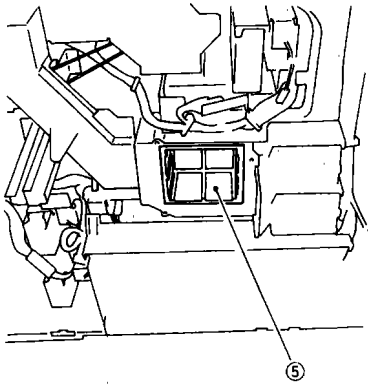


Figure 4-125

## 5. Ozone Exhaust Fan 2 (FM13)

**a. Detaching the Ozone Filter**

1) Remove the rear cover.
2) Remove the ozone filter ①.

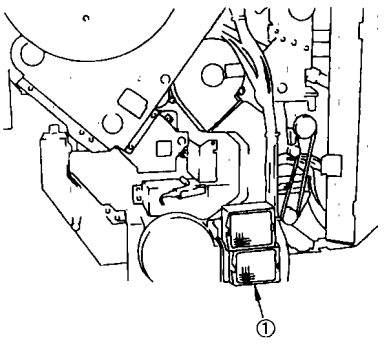


Figure 4-126

**b. Detaching the Ozone Exhaust Fan 2**

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the three screws ②, and disconnect the connector ③; then, shift the ozone exhaust fan ④ to remove.

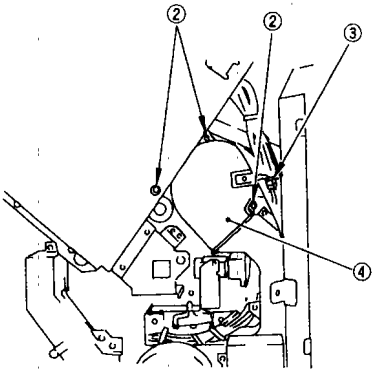


Figure 4-127

**c. Detaching the Air Filter of the Ozone Exhaust Fan**

1) Remove the rear cover.
2) Remove the ozone exhaust fan.
3) Remove the air filter ⑤.

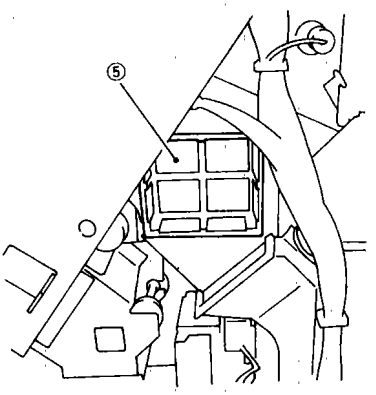


Figure 4-127-1


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## 6. Electrical Unit Fan (FM10)

**a. Detaching the Electrical Unit Fan (FM10)**

1) Remove the reader controller cover.
2) Remove the upper right cover.
3) Remove the three screws ①, and remove the electrical unit fan mount ②.

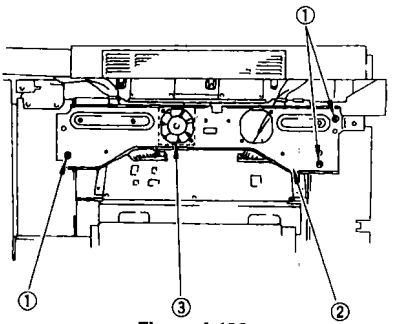


**Figure 4-128**

4) Remove the two screws, and disconnect the connector; then, remove the electrical unit fan ③.

**b. Points to Note When Attaching the Electrical Unit Fan**

**Caution:**
Be sure to install the electrical unit fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

## 7. Scanner Cooling Fan 1/2 (FM1/ FM5)

**a. Removing the Original Illumination System Cooling Fan 1/2**

1) Remove the reader controller cover.
2) Remove the upper right cover.
3) Remove the two screws ①, and remove the scanner cooling fan cover ②.

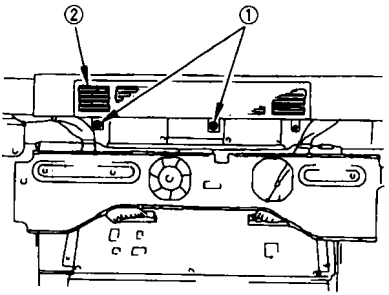


**Figure 4-129**

4) Remove the two screws (each) from the fan, and disconnect the connector; then, remove the fan.

**b. Removing the Air Filter**

1) Remove the two screws and disconnect the connector from each fan, and remove the fans.
2) Remove the air filter.

**c. Points to Note When Attaching the Scanner Cooling Fan 1/2**

**Caution:**
Be sure to install the scanner cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

## 8. Scanner Cooling Fan 3/4 (FM6/7)

**a. Removing the Scanner Cooling Fan 3/4**

1) Remove the upper left cover.
2) Remove the two screws ①, and remove the scanner cooling fan cover ②.

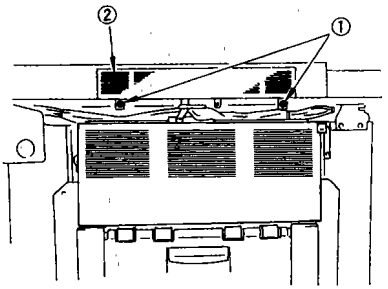


**Figure 4-130**

3) Remove the screw, and remove the interface harness retainer. (This step applies only when the IP-ED or IP-IF PCB is installed.)
4) Remove the two screws and disconnect the connector from each fan, and remove the fans.

**b. Detaching the Scanner Cooling Fan 3/4**

**Caution:**
Be sure to install the scanner cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.

## 9. IP Cooling Fan (FM9)

**a. Detaching the IP Cooling Fan**

1) Remove the inside left cover.
2) Remove the three screws ① and disconnect the connector; then, remove the IP cooling fan cover ②.

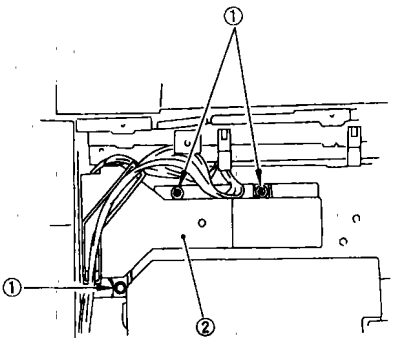


**Figure 4-131**

3) Remove the two screws, and remove the IP cooling fan.

**b. Points to Note when Attaching the IP Cooling Fan**

**Caution:**
Be sure to install the IP cooling fan carefully orienting it for the direction of air; pay attention to the markings on the fan housing.


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## 10. Feeding Fan 1/2 (FM14/15)

**a. Detaching the Feeding Fan**

1) Open the front door, and pull out the transfer assembly frame.
2) Put down the fixing assembly from the transfer assembly frame.
3) Put down the transfer drum unit from the transfer frame.
4) Put down the transfer assembly frame from the copier.
5) Remove the two screws ①, and disconnect the connector ②; then, remove the feeding fan ③.

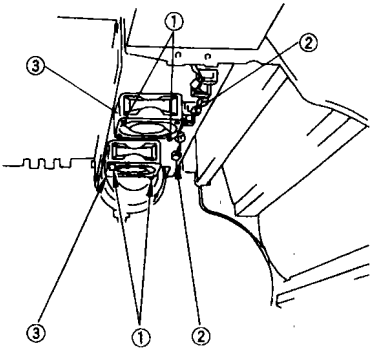

Figure 4-132

**b. Points to Note When Attaching the Feeding Fan**

**Caution:**
Be sure to install the feeding fan carefully orienting it for the direction of air, i.e., flowing from above to below; pay attention to the markings on the fan housing.

## 11. HVT PCB Cooling Fan (FM12)

**a. Detaching the Developing Bias Power Supply PCB Cooling Fan**

1) Remove the rear cover.
2) Disconnect the seven high-voltage connectors ① from the HVT PCB.
3) Disconnect the four connectors ② (J1, J2, J3/J5); then, remove the screw to remove the grounding wire.
4) Remove the three screws ③; then, remove the HVT PCB ④, and position it toward the front.

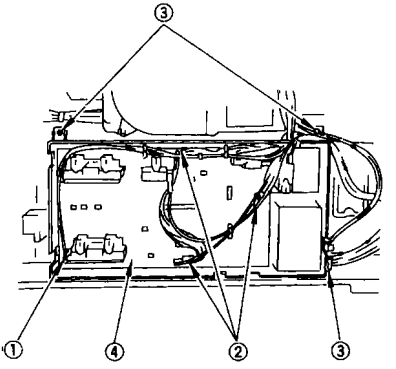

Figure 4-133

5) Disconnect the connector ⑤, and remove the screw ⑥; then, remove the fan ⑦ together with its mount.

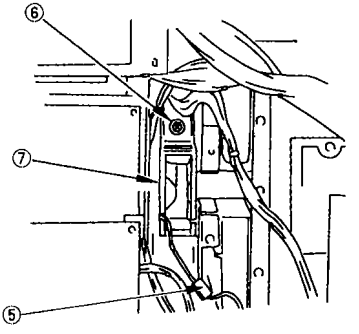

Figure 4-134

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**b. Points to Note When Attaching the Developing Bias Power Supply PCB**

**Caution:**
Be sure to orient the power supply cooling fan so that it draws air from the direction of the power supply PCB; pay attention to the markings on the fan housing.

## 12. Power Supply Cooling Fan (FM8)

**a. Detaching the Power Supply Cooling Fan**

1) Remove the lower left cover.
2) Remove the two screws ①, and disconnect the connector ②; then, pull out the power supply unit.

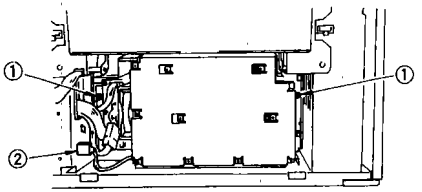


**Figure 4-135**

3) Disconnect the eight connectors (J22, J24, J23, J27, J28, J25, J26, J29), and disconnect the relay connector.
4) Disconnect the connector, and remove the two screws; then, remove the power supply cooling fan.

**b. Points to Note When Attaching the Power Supply Cooling Fan**

**Caution:**
Be sure to install the power supply cooling fan carefully orienting it for the direction of air, i.e., toward the power supply PCB; pay attention to the markings on the fan housing.


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# II. DRIVE SYSTEM

## A. Drive System Belt Layout

- The copier's drive belts are arranged as follows:

① Belt for developing assembly, registration assembly, and photosensitive drum cleaner
② Belt for feeding assembly and delivery/feeding assembly
③ Belt for pick-up assembly
④ Belt for duplexing unit feeding assembly

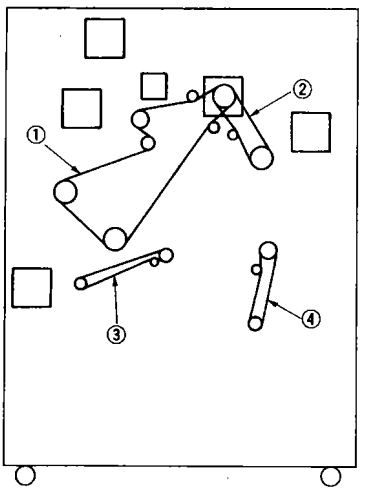


Figure 4-201

## B. Drum Motor Assembly

### 1. Detaching the Drum Motor (M2)

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

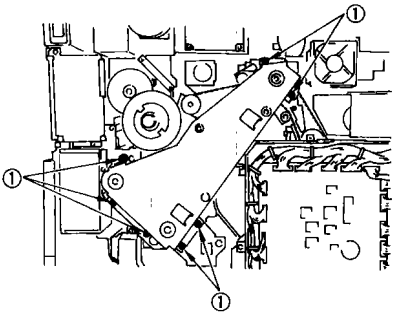


Figure 4-202

5) Remove the two screws ②, and disconnect the three connectors ③; then, remove the lamp regulator PCB ④.

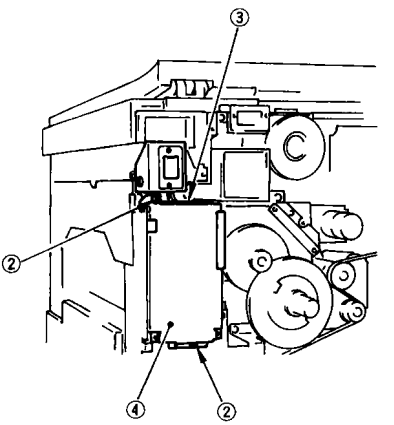


Figure 4-203

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6) Remove the sensor flag, remove the screw ⑤, and remove the two hex screws ⑥; then, remove the gear ⑦ installed to the drum shaft.

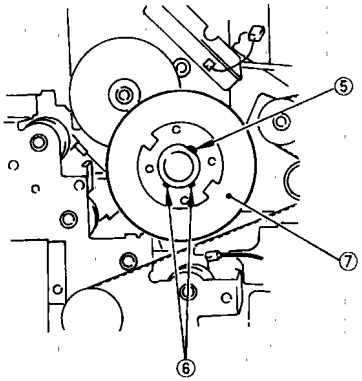


**Figure 4-204**

7) Remove the screw ⑧, and disconnect the connector ⑨; then, remove the photosensitive drum home position sensor together with its mount ⑩.

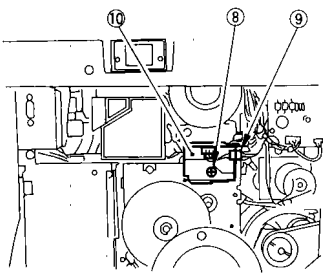


**Figure 4-205**

8) Disconnect the three connectors ⑪, and remove the seven screws ⑫; then, remove the drum motor together with its mount.

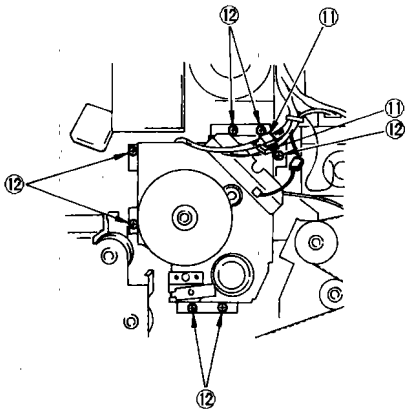


**Figure 4-206**

9) Remove the four screws, and remove the drum motor from its mount.

**Caution**

Go through the following steps when installing the drum motor assembly to the machine:

1) Remove the six screws ①, and remove the butting block ②; then, remove the photosensitive drum ③ from the photosensitive drum frame unit ④.

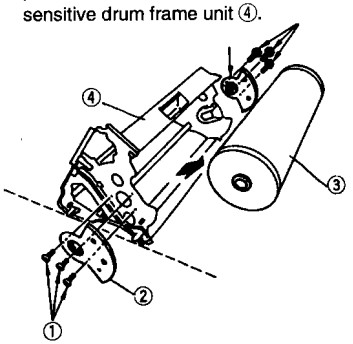


**Figure 4-207**


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3) Insert the photosensitive drum frame unit ⑤ into the machine, and fix it in place using three screws ⑥.

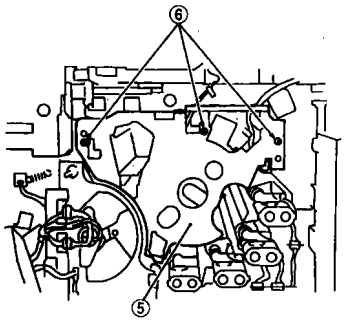


**Figure 4-208**

4) Temporarily fix the drum motor assembly ⑦ using seven screws ⑧. (If the drum shaft support fixing ⑨ is found, remove it.)

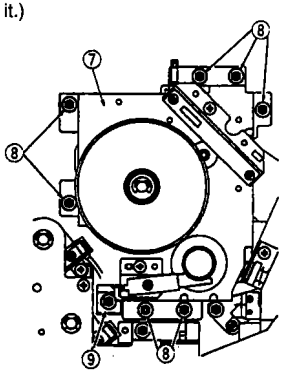


**Figure 4-209**

5) Attach the drum shaft positioning tool (FY9-3016-000; ⑩) to the photosensitive drum frame unit ⑫ using the two screws ⑪ removed in step 2).

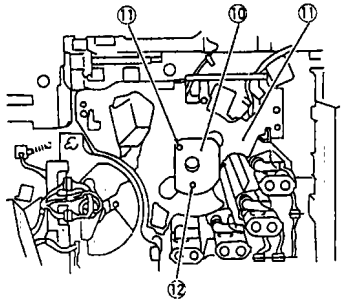


**Figure 4-210**

6) Fix the drum motor assembly and the drum shaft support plate fixing securely using eight screws.
7) Detach the drum shaft positioning tool, and slide out the photosensitive drum frame unit from the machine; then, install the unit and parts removed in step 1).

## 2. Detaching the Drum Home Position Sensor

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the sensor flag ①. (TYPE 2 only)

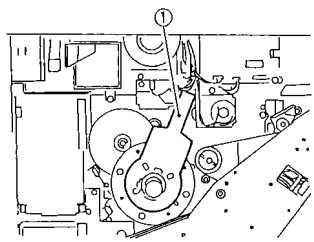


**Figure 4-211**

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4) Disconnect the connector ②, and remove the screw ③; then, remove the drum home position sensor ④ together with its mount. (TYPE 1 only)

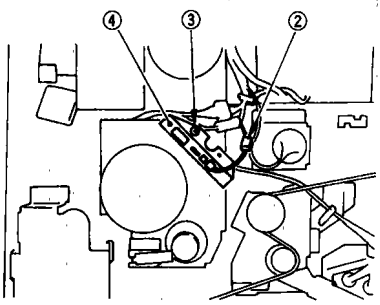


**Figure 4-212**

5) Remove the screw ⑤, and disconnect the connector ⑥; then, remove the photosensitive drum home position sensor together with its mount ⑦.

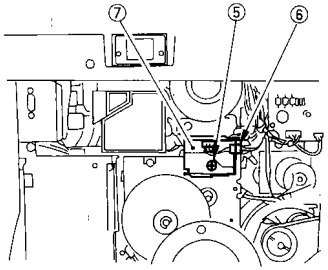


**Figure 2-213**

6) Remove the sensor from the mount.

## 3. Detaching the Drum Heater

1) Remove the drum.
2) Put the photosensitive drum with the drum heater friction plate at the bottom.
3) Remove the two screws ①, and remove the drum flange (front) ②.

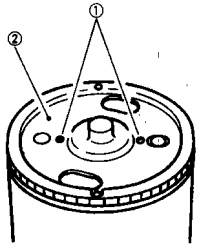


**Figure 4-214**

4) Disconnect the connector ③, and pull out the drum heater ④.

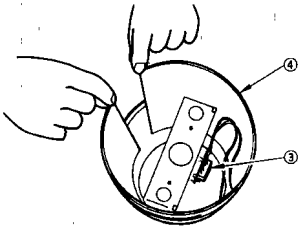


**Figure 4-215**

## 4. Detaching the Drum Heater Brush

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the drum motor. (See II-B-1.)
4) Remove the screw ①, and disconnect the two connectors ②; then, remove the drum heater brush.

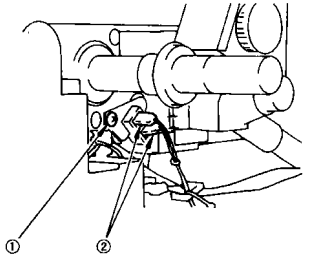


**Figure 4-216**


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## C. Main Motor (M4) Drive Assembly

### 1. Detaching the Main Motor (M4)

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

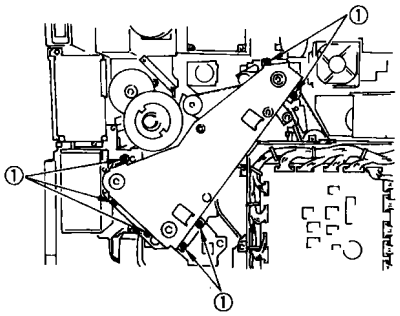


Figure 4-217

5) While holding the tensioner ② up, remove the drive belt 1 ③.

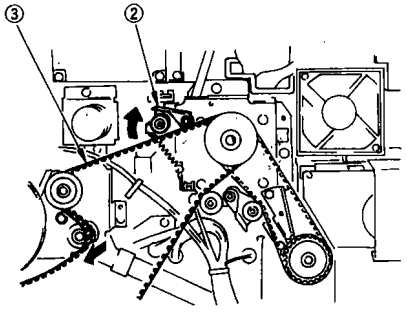


Figure 4-218

6) While pushing the tensioner ④ to the left, remove the drive belt 2 ⑤.

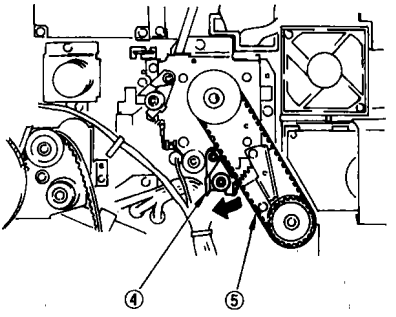


Figure 4-219

7) Disconnect the two connectors ⑥, and remove the four screws ⑦; then, remove the main motor together with its mount.

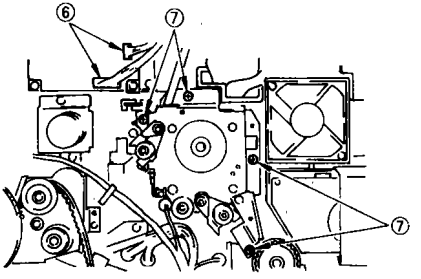


Figure 4-220

8) Remove the four screws, and remove the main motor from its mount.

## D. Fixing Assembly Motor (M5) Drive Assembly

### 1. Detaching the Fixing Assembly Motor (M5)

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the fixing assembly motor cover. (Pull it out toward the front while opening it up and down.)
4) Disconnect the two connectors ①, and remove the four screws ②; then, pull out the PCB from the locking support ③ to remove the fixing motor together with its mount.

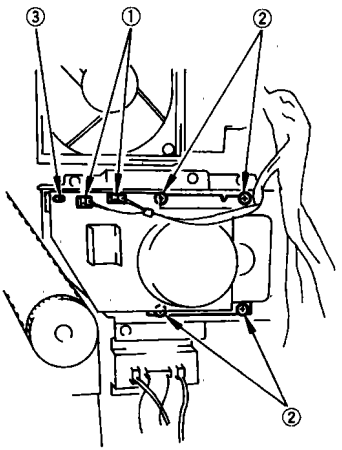


Figure 4-221

## E. Pick-Up Motor (M6) Drive Assembly

### 1. Detaching the Pick-Up Motor

1) Remove the lower right cover.
2) Remove the rear cover.
3) Draw out the cassette 2 or the duplexing unit; then, remove the cassette 2 pick-up assembly or the duplexing unit pick-up assembly.
4) Remove the two screws ①, and remove the duct ② of the ozone exhaust fan.

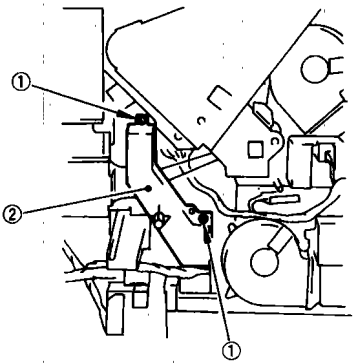


Figure 4-222

5) While releasing the tensioner ③, remove the cassette 1 pick-up assembly drive belt ④.

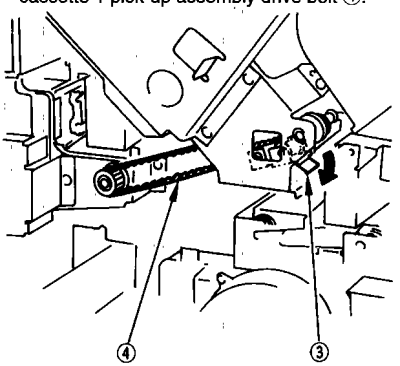


Figure 4-223


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6) Free the harness from the locking support ⑤, and remove the locking support.

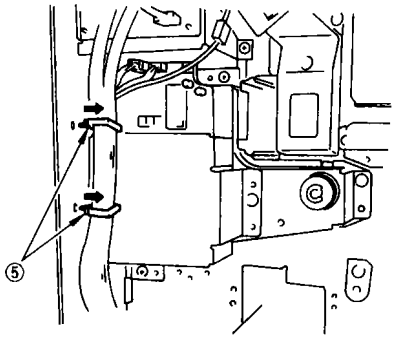


**Figure 4-224**

7) Remove the two screws ⑥, and remove the grip ⑦ for transport.

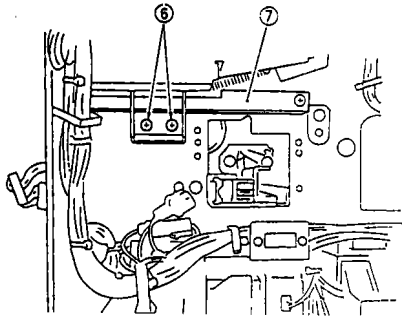


**Figure 4-225**

8) Disconnect the two connectors ⑧ and relay connector ⑨; then remove the three screws ⑩.

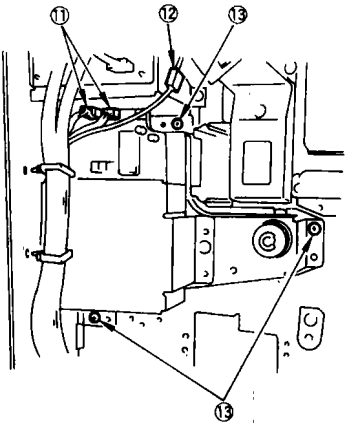


**Figure 4-226**

9) Release the gear ⑪ of the duplexing unit pick-up assembly/cassette 2 pick-up assembly toward above, remove the pick-up motor unit.

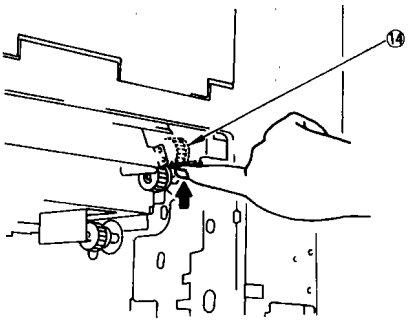


**Figure 4-227**

10) Remove the screw ⑫, and remove the pick-up motor cover ⑬ from the pick-up motor unit.

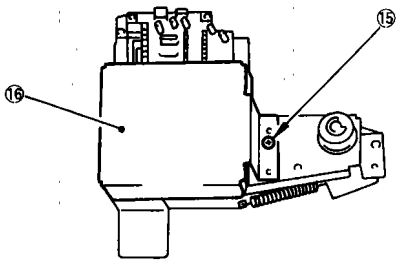


Figure 4-228

11) Remove the two screws ⑭, and remove the pick-up motor ⑮.

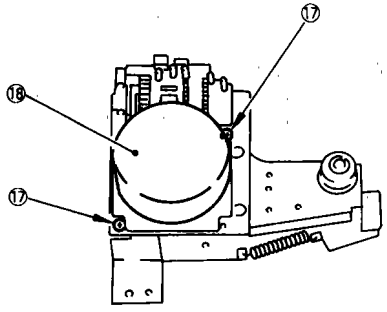


Figure 4-229

# F. Developing Assembly Drive Assembly

## 1. Detaching the Developing Assembly Drive Assembly

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

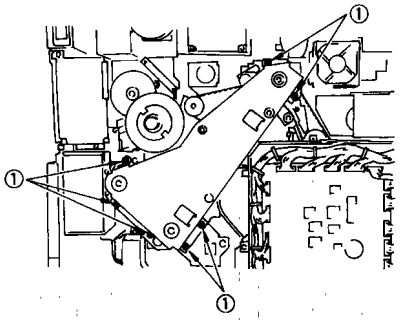


Figure 4-230

5) Remove the two screws ②, and disconnect the three connectors ③; then, remove the lamp regulator PCB ④.

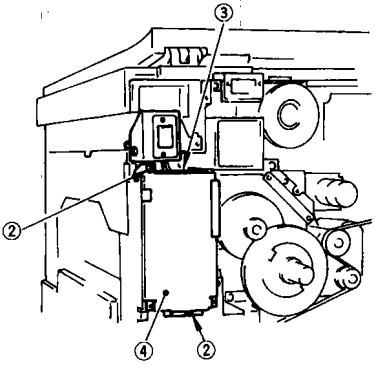


Figure 4-231


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6) While holding the tensioner ⑤ up, remove the drive belt 1 ⑥.

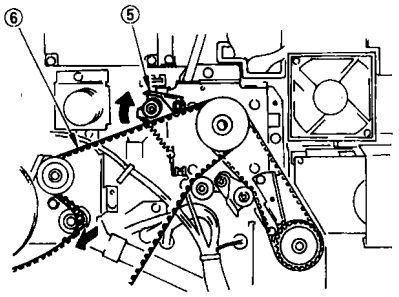


**Figure 4-232**

7) Disconnect the four connectors ⑦, and remove the two screws ⑧; then, remove the potential measuring PCB ⑨.

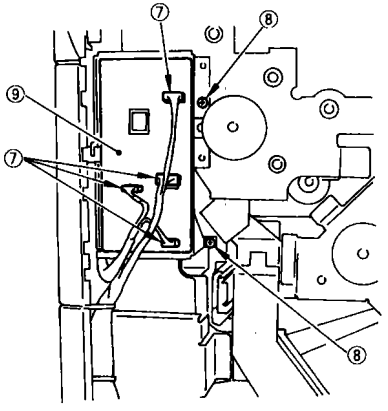


**Figure 4-233**

8) Open the locking support ⑩, and disconnect the four developing bias high-voltage connector ⑪.
9) Disconnect the two relay connectors ⑫.
10) Disconnect the relay connector of the waste toner clogging detection switch.
11) Remove the three screws ⑬.

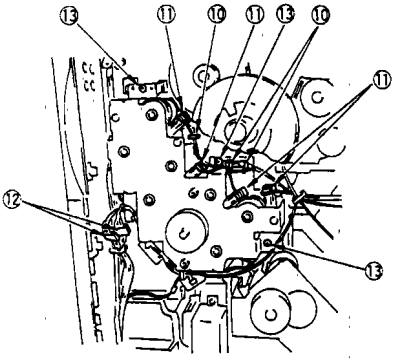


**Figure 4-234**

12) Shift the developing assembly drive unit up to remove.

**Caution:**
Note the hooks found at top/botton of the developing assembly drive unit when detaching or attaching it.

**Caution:**
If poor contact is noted between the developing assembly drive unit and the developing assembly high-voltage supply unit, or a development fault caused by such poor contact, replace the old parts with new ones as shown in XI "Others" in Chaper 4.

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# G. Photosensitive Drum Cleaner Assembly

## 1. Detaching the Photosensitive Drum Cleaning Drive Assembly/ Reciprocating Motor

1) Remove the rear cover.
2) Remove the flywheels.
3) Remove the screw, and open the DC controller PCB.
4) Remove the seven screws ①, and remove the drive assembly reinforcing plate.

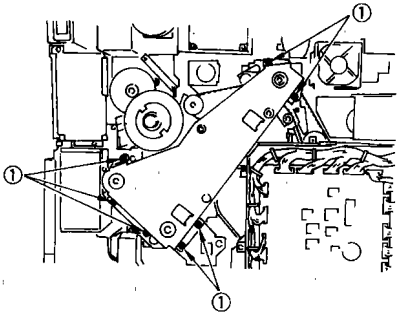


**Figure 4-235**

5) Remove the upper right cover.
6) Remove the screw ② and two hex screws ③, and remove the gear ④ installed to the drum shaft.

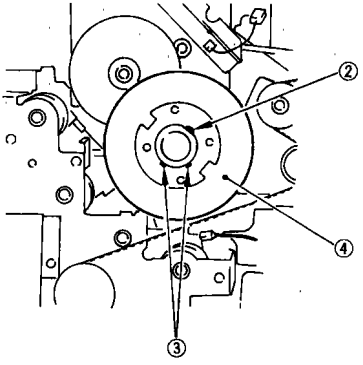


**Figure 4-236**

7) While holding the tensioner ⑤ up, remove the drive belt 1 ⑥.

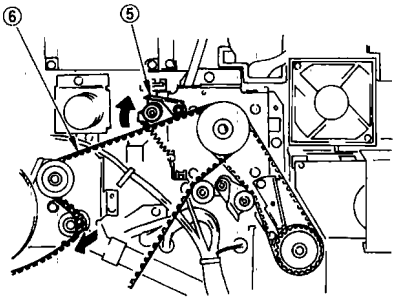


**Figure 4-237**

8) Disconnect the connector ⑦, and remove the two screws ⑧; then, remove the reciprocating motor.

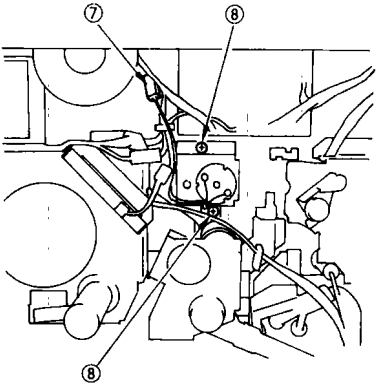


**Figure 4-238**

**Caution:**

The one-way clutch is in its active position when the transfer drum is on the transfer assembly frame; do not turn the transfer drum with your fingers inside the transfer drum.

Moreover, do not turn it when the transfer drum is off the transfer assembly frame; otherwise, the transfer drum will rotate in reverse, damaging the transfer brush or retention brush.


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9) Remove the three screws ⑨, and remove the photosensitive drum cleaner drive assembly.

**Caution:**
Take adequate care not to drop the floating gear unit and three bushings inside the photosensitive drum cleaner drive assembly.

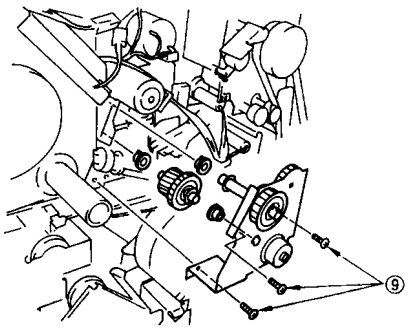


**Figure 4-239**

**Caution:**
If the reciprocating motor of the photosensitive cleaner assembly fails to turn off or on, the transistor on the DC controller PCB may be damaged. Be sure to replace the DC controller PCB as necessary.

# H. Transfer Drum Cleaner Assembly

## 1. Removing the Polishing Roller

**Caution:**
Do not turn the transfer drum with your fingers in its window, as one-way clutch is active while the transfer drum remains fitted in the transfer assembly frame.
Likewise, take extra care after removing the transfer drum, as it will rotate in reverse, causing damage to the transfer brush and retention brush.

1) Detach the transfer drum from the transfer assembly frame.
2) Push the polishing roller toward the front of the transfer drum to remove.

**Caution**
Take care not to touch the transfer sheet.

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## 2. Removing the Polishing Roller Motor

1) Detach the transfer drum from the transfer assembly frame.
2) Tilt the transfer drum unit as shown in Figure 4-239 to avoid damaging the transfer drum sheet. (If you can, put an object next to the rear side plate of the transfer drum unit.)
3) Remove the drive belt ① of the polishing roller motor, disconnect the connector ②, and remove the three screws ③; then, remove the motor ④.

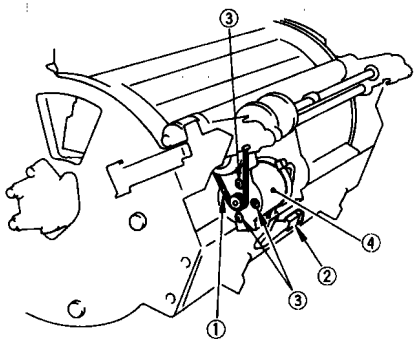


**Figure 4-240**

## 3. Detaching the Polishing Roller Unit

1) Remove the transfer drum from the transfer assembly unit.
2) Place the transfer drum unit on a level surface at an angle as shown in Figure 4-233 so as to avoid damage to the transfer drum sheet.
3) Remove the screw ①, and rotate the polishing roller lever ② counterclockwise to release the polishing roller.

**Caution:**
The four pins ③ used to keep the spring in place will slip off when the transfer drum is released; take care not to lose the pins.

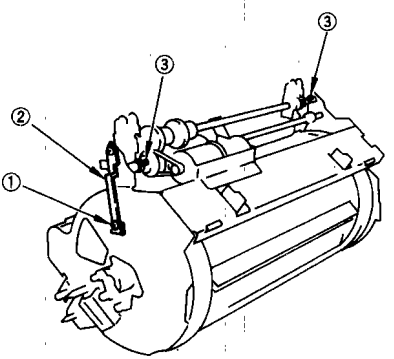


**Figure 4-241**


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4) Remove the screw ④ and E-ring ⑤ (found on the inner side of the shaft 1); then, remove the shaft connecting member, and remove the gear unit 1 ⑥ together with its shaft.

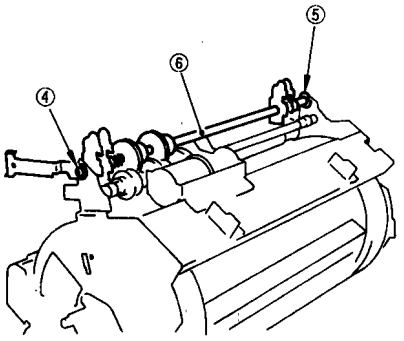


Figure 4-242

5) Remove the E-ring ⑦ (found on the outer side of the shaft 2) and the two screws ⑧; then, remove the polishing roller motor unit ⑨.

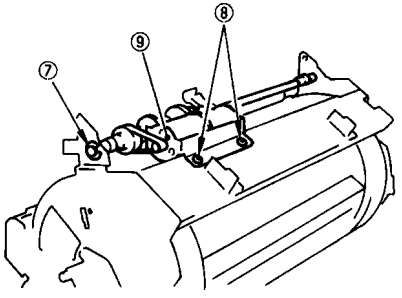


Figure 4-243

## 4. Detaching the Oil Removing Roller

1) Remove the transfer drum unit.
2) Remove the oil removing roller ① while pushing it against the rear.

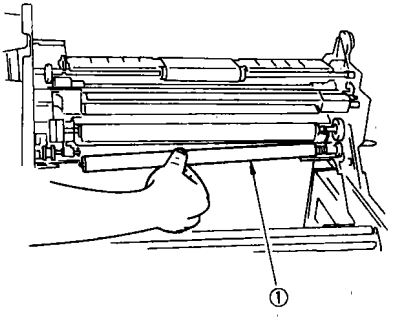


Figure 4-244

## 5. Detaching the Transfer Cleaner Unit

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the screw ①, and remove the external static eliminator ②.

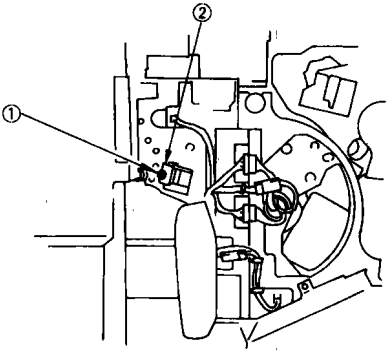


Figure 4-245

4) Remove the two screws ③, and remove the rail ④ of the external static eliminator.

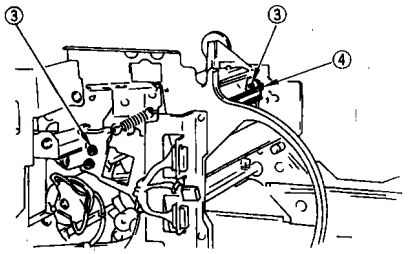


**Figure 4-246**

5) Remove the screw ⑤, and remove the bushing of the cleaner unit.
Disconnect the connector ⑥, and remove the screw to remove the metal fixing.

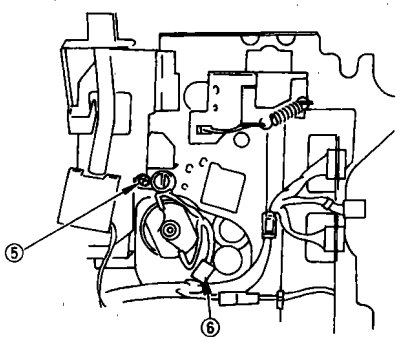


**Figure 4-247**

6) Remove the transfer cleaner unit ⑦ from the transfer assembly frame as shown in Figure 4-248.

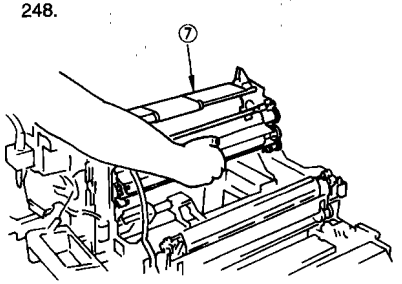


**Figure 4-248**

## 6. Detaching the Transfer Cleaner External Brush

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the transfer cleaner unit.
4) Remove the three screws ①, and remove the transfer cleaning unit upper cover ②.

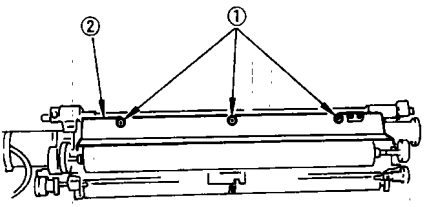


**Figure 4-249**

5) Remove the E-ring ③ from the rear of the transfer cleaner unit, and remove the spacer ④.

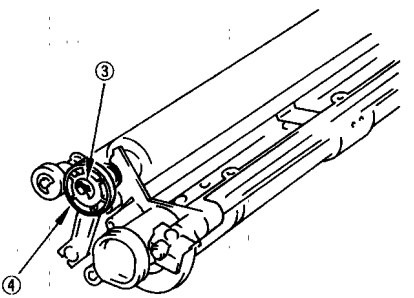


**Figure 4-250**


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6) Remove the two E-rings from the front of the transfer cleaner unit; then, move the line of gears toward the rear, and pull out the parallel pin ⑥; and then remove the three gears ⑦, and remove the spacer ⑧.

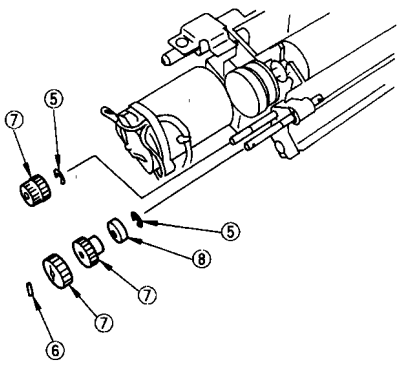


**Figure 4-251**

7) Remove the E-ring ⑨ and spacer ⑩.

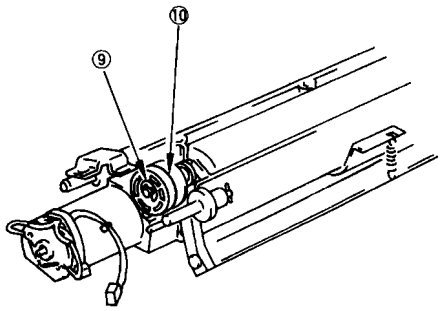


**Figure 4-252**

8) Remove the timing belt ⑪, and remove the gear ⑫. (At this time, take care not to drop the parallel pin ⑬.)

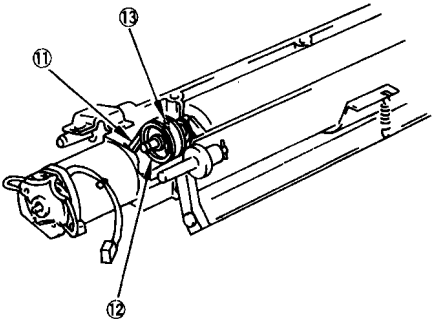


**Figure 4-253**

9) Remove the two E-rings ⑭, and remove the transfer cleaner external brush unit ⑯ while keeping the bearing ⑮ toward the outside.

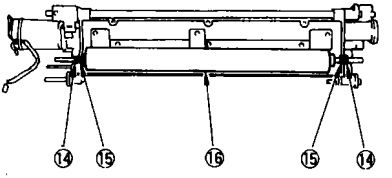


**Figure 4-254**

10) Loosen the hex screw ⑰ fully, and remove it; then, remove the transfer cleaner external brush ⑱. (Do not remove the E-ring ⑲.)

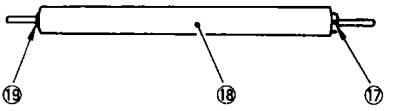


**Figure 4-255**

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## 7. Detaching the Scraper (upper, lower) of the Transfer Cleaner Unit

1) Remove the transfer drum unit.
2) Remove the oil removing roller while pushing it against the rear.
3) Remove the transfer cleaner unit.
4) Remove the transfer cleaner external brush unit.
5) Remove the three screws ①, and remove the transfer cleaner cover ②.

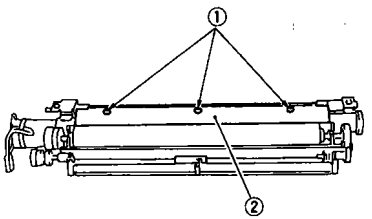


**Figure 4-256**

6) Remove the three screws ③, and remove the scraper (upper) ④.

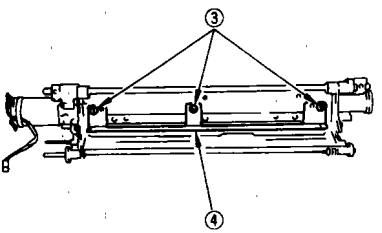


**Figure 4-257**

7) Remove the three screws ⑤, and remove the scraper (lower) ⑥.

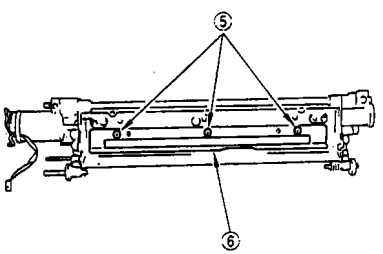


**Figure 4-258**

## 8. Removing the Transfer Drum Cleaner Motor

1) Remove the transfer drum unit.
2) Remove the transfer cleaner unit.
3) Remove the two screws ①, and remove the cleaner motor (M10).

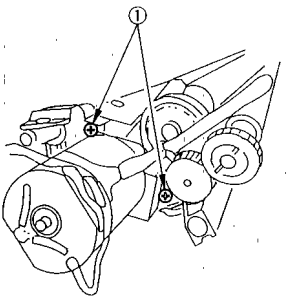


**Figure 4-259**


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# I. Scanner Assembly

## 1. Detaching the Scanner Drive Motor

1) Remove the rear cover, and remove the flywheels.
2) Remove the primary corona assembly fan. (See p. 4-8.)
3) Remove the four screws, and shift the scanner motor driver PCB to the right. (See p. 4-106/107.)
4) Remove the four screws ①, and remove the scanner drive motor ② together with its support plate.

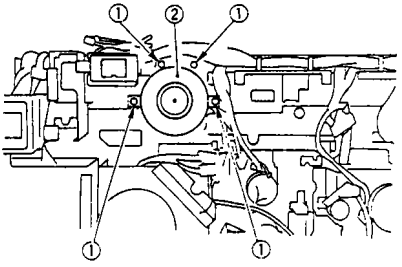


**Figure 4-260**

5) Remove the two screws, and remove the scanner drive motor from the support plate.

## 2. Adjusting the Belt Tension When Attaching the Scanner Drive Motor

1) Move the motor to the right, and tighten the screw.

## 3. Routing the Scanner Cable

You must have the mirror positioning tool (FY9-3002-000) handy when routing the scanner cable.

1) Remove the copyboard cover.
2) Remove the vertical size plate.
3) Remove the copyboard glass.
4) Remove the control panel.
5) Remove the upper rear cover.
6) Remove the upper cover.
7) Remove the two screws ①, and remove the standard white plate ②.

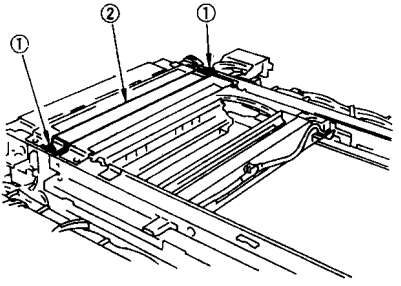


**Figure 4-261**

8) Remove the rear cover, and remove the flywheel.
9) Remove the three screw ③, and remove the DF mount ④ (rear left; fixing assembly side).

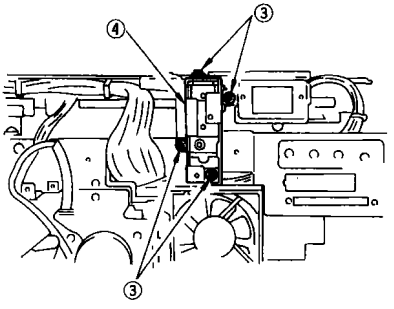


**Figure 4-262**

10) Move the No. 2 mirror mount, and position it so that its pulley shaft ⑤ is in view through the long hole in the side plate.

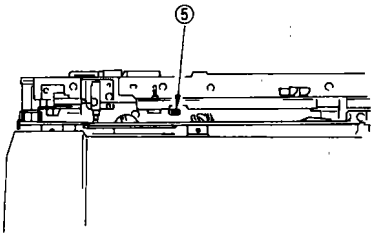


**Figure 4-263 (front)**

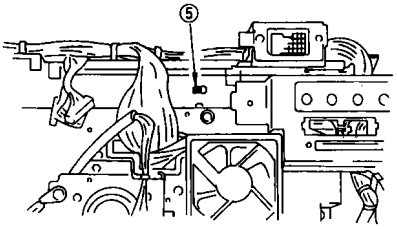


**Figure 4-264 (rear)**

11) Fit the binding screw ⑥ (M4x8) to the pulley shaft, thereby temporarily fixing the pulley to the side plate (front, rear) and ultimately to the No. 2 mirror mount.

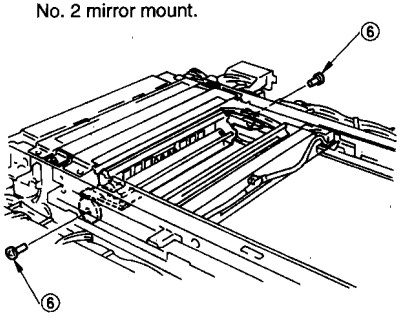


**Figure 4-265**

**Caution:**
When installing the standard white plate, make sure that the cut-off is toward the front as indicated.

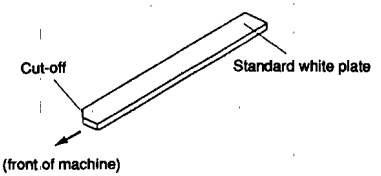


**Figure 4-266**


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12) Engage the scanner cable to the pulley and the hook as indicated in Figure 4-267.

**Caution:**
Take care not to damage the wire by the edge of the metal plate.

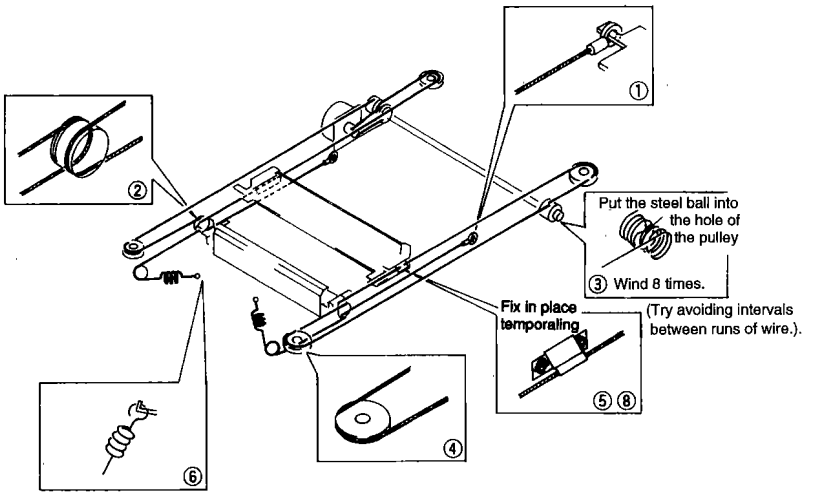


**Figure 4-267**

13) Remove the screw (front, rear) fitted in step 11).
14) Loosen the screws on the mirror positioning tool (FY9-3002-000), and fully extend the arm ⑦.

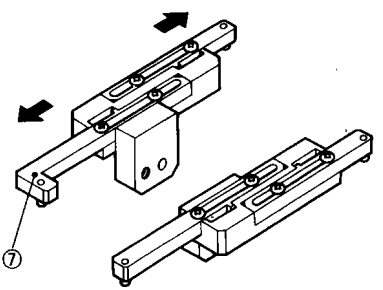


**Figure 4-268**

15) Fit the mirror positioning tool ⑧ between the No.1 mirror mount and the No.2 mirror mount, and insert the pin ⑨ found on the mirror positioning tool.

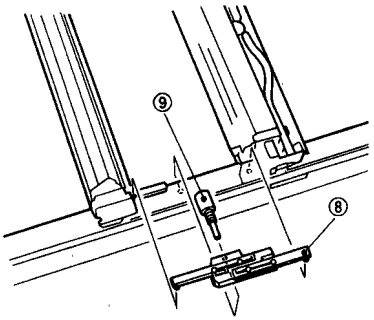


**Figure 4-269 (front)**

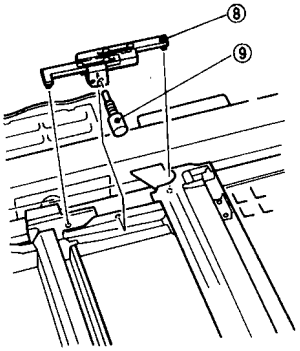


**Figure 4-270 (rear)**

16) Install the metal fixing ⑩ of the scanner cable to the No.1 mirror mount using screws ⑪ through the angle hole in the side plate.

**Caution:**

You must remove the scanner motor driver PCB and the main motor PCB when installing the metal fixing at the rear.

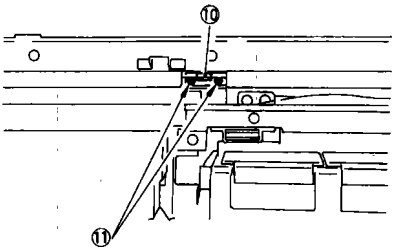


**Figure 4-271 (front)**

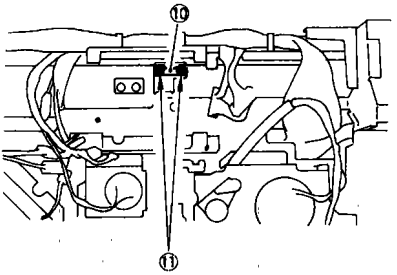


**Figure 4-272 (rear)**

17) Remove the mirror positioning tool.

**Reference:**

You need not adjust the tension of the cable for the copier.


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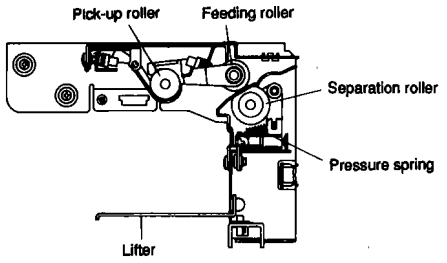
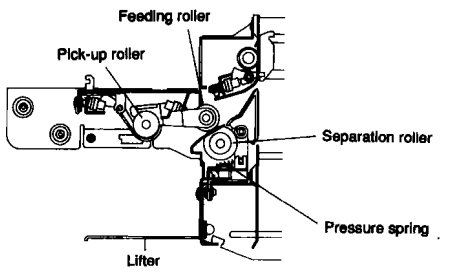
# III. FEEDING SYSTEM

## A. Pick-Up Assembly

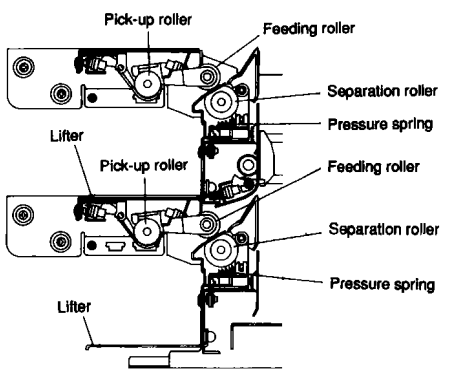
### 1. Construction




Cassette 1 Pick-up Assembly




Cassette 2 Pick-up Assembly




Cassette 3/4 Pick-up Assembly

**Figure 4-3001**

### 2. Detaching the Cassette 1 Pick-Up Assembly

1) Open the front door (left, right).
2) Slide out the cassette 1.
3) Remove the screw ①, and remove the cassette 1 pick-up assembly cover ②.

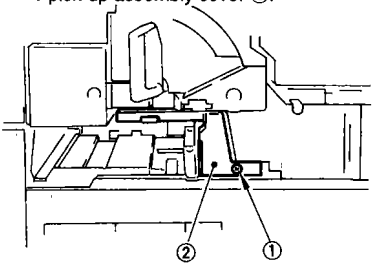



**Figure 4-3002**

4) Remove the duplexing unit/cassette 2. (See p. 4-100.)
5) Remove the screw, and remove the servicing document case cover; then, remove the two screws, and remove the stay. (CLC700 only)
6) Disconnect the connector ③, and remove the three screws ④; then, slowly slide out the cassette 1 pick-up assembly ⑤.

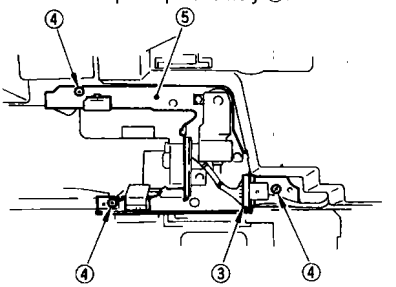



**Figure 4-3003**

### 3. Detaching the Cassette 2/ Duplexing Unit Pick-Up Assembly

1) Remove the lower right cover.
2) Slide out the cassette 2 or duplexing unit.
3) Disconnect the two connectors ①, and remove the four screws ②; then, slowly slide out the pick-up assembly to remove.

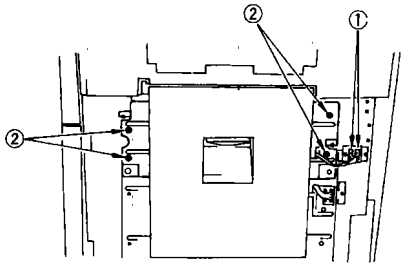



Figure 4-3004

**Caution:**
Note that the pick-up assembly slides out on its rails about 5 cm in length; it will slide out of the rails if pulled out any farther.

### 4. Detaching the Cassette 3/4 Pick-Up Assembly

1) Remove the lower right cover.
2) Remove the duplexing unit pick-up assembly.
3) Slide out the cassette 3 and cassette 4.
4) Disconnect the two connectors ①, and remove the four screws ②; then, slide out the pick-up assembly to remove.

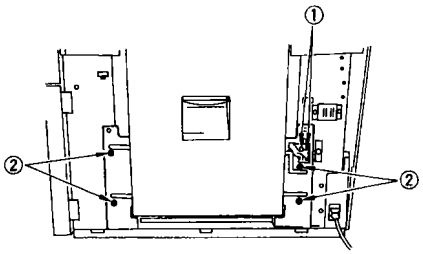



Figure 4-3005

**Caution:**
You must slide out the cassettes 1, 2, 3, and 4 when attaching each pick-up assembly.

### 5. Detaching the Pick-Up Roller

1) Remove the cassette 1/2/3/ pick-up assembly.
2) Remove the two E-rings ① (made of resin), and pull out the two pick-up rollers ② together with the collars.

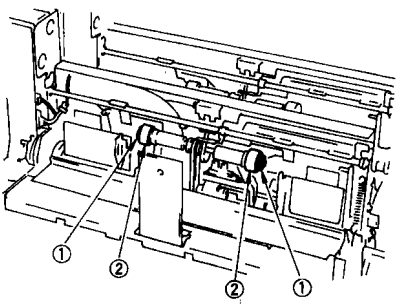



Figure 4-3006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**Caution:**

a. When attaching the pick-up roller ① to the pick-up assembly, make sure that the round marking ② on its rubber portion is toward the copier's front.

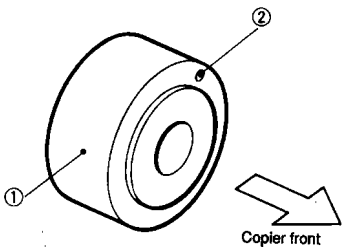


**Figure 4-3007**

The pick-up rollers are identified by color as follows:

- brass for the front
- silver for the rear

Make sure the correct rollers are used.

b. Do not remove the rubber portion of the pick-up roller from the collar.

## 6. Detaching the Cassette 1 Pick-Up Assembly Feeding Roller

1) Remove the cassette 1 pick-up assembly.
2) Remove the screw ①, and remove the pick-up assembly support plate ②.

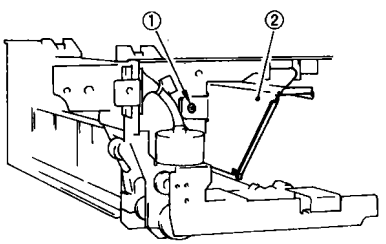


**Figure 4-3008**

3) Remove the screw ③, and remove the lower guide ④.

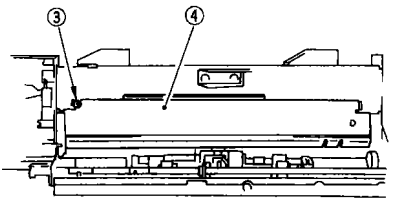


**Figure 4-3009**

4) Remove the screw ⑤, and remove the upper guide ⑥.

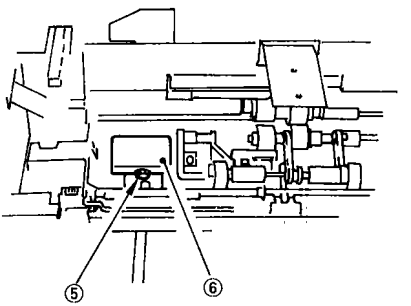


**Figure 4-3010**

5) Remove the screw ⑦, and remove the pick-up roller arm bushing ⑧.

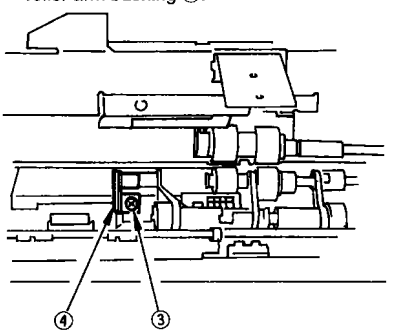


**Figure 4-3011**

6) Remove the E-ring ⑨ (made of resin), and remove the pick-up roller ⑩ from the rear.
7) Remove the E-ring ⑪ (made of resin).

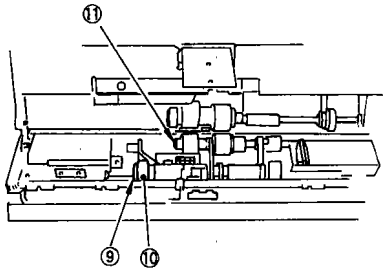


**Figure 4-3012**

8) Pull off the feeding roller ⑬ from the shaft together with the belt and pick-up roller shaft ⑫.

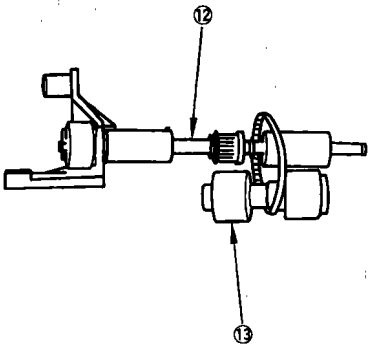


**Figure 4-3013**

## 7. Detaching the Cassette 2/3/4 Pick-Up Assembly Feeding Roller

1) Remove the cassette 2/3/4 pick-up assembly.
2) Remove the screw ①, and remove the upper guide ②.

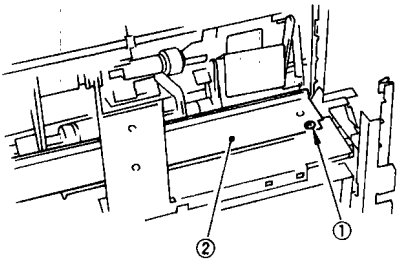


**Figure 4-3014**

3) Remove the screw ③, and remove the pick-up roller arm bushing ④.

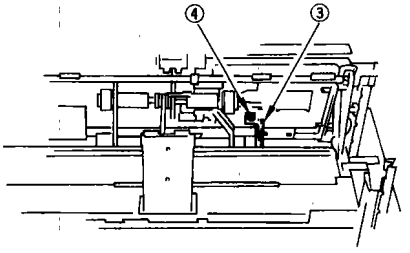


**Figure 4-3015**

4) Remove the E-ring ⑤ (made of resin), and remove the pick-up roller ⑥ from the rear.
5) Remove the E-ring ⑦ (made of resin).

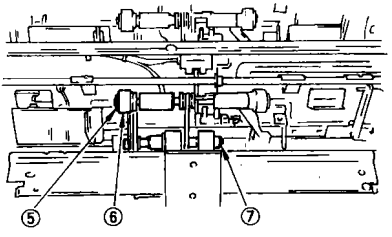


**Figure 4-3016**


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6) Pull out the feeding roller ⑨ from the shaft together with the belt and pick-up roller shaft ⑧.

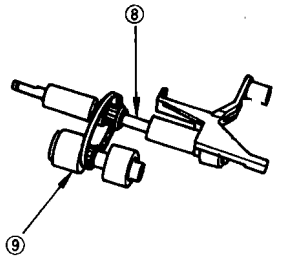


Figure 4-3017

**Caution:**
Take extra care when detaching the pick-up roller shaft: sensors are installed to some shafts.

**Caution:**
When attaching the feeding roller ①, make sure that the gear ② installed to the feeding roller is toward the copier's rear.

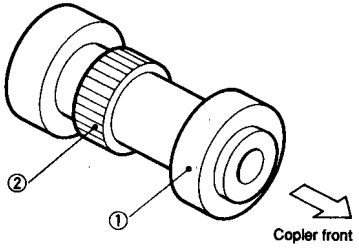


Figure 4-3018

## 8. Detaching the Cassette 1 Pick-Up Assembly Separation Roller

1) Remove the cassette 1 pick-up assembly.
2) Remove the screw ①, and remove the pick-up assembly support plate ②.

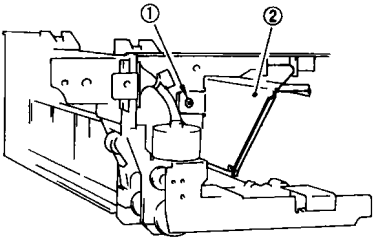


Figure 4-3019

3) Remove the screw ③, and remove the lower guide ④.

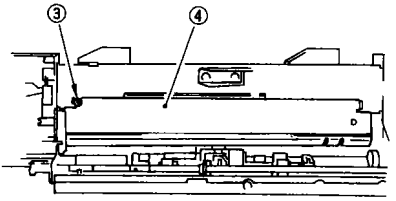


Figure 4-3020

4) Remove the two screws ⑥, and remove the separation roller unit ⑤.

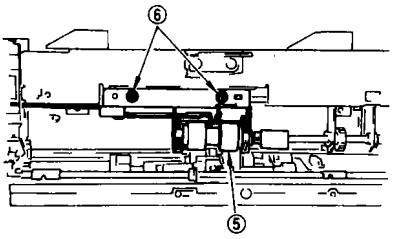


Figure 4-3021

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5) Remove the E-ring ⑦ (made of resin).
6) Pull out the separation roller shaft ⑧, and remove the separation roller ⑨.

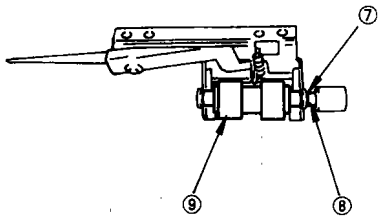


Figure 4-3022

**Caution:**
When attaching the separation roller ① to the pick-up assembly, make sure that the D-shaped cut is toward the copier's front.

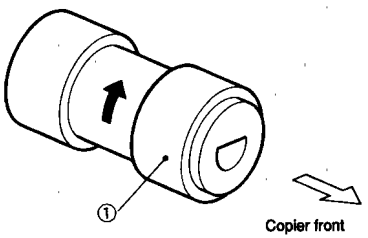


Figure 4-3023

## 9. Detaching the Cassette 2/3/4 Pick-Up Assembly Separation Roller

1) Remove the cassette 2/3/4 pick-up assembly.
2) Remove the screw ②, and remove the lower guide ①.

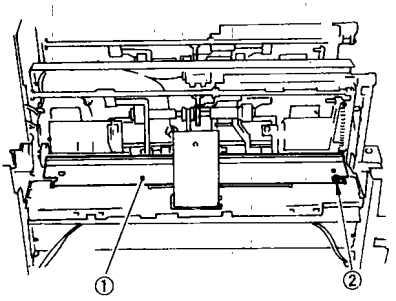


Figure 4-3024

3) Remove the two screws ④, and remove the separation roller unit ③.

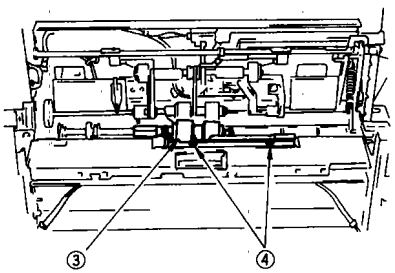


Figure 4-3025

4) Remove the two E-rings ⑤ (made of resin).
5) Pull out the separation roller shaft ⑥, and remove the separation roller ⑦.

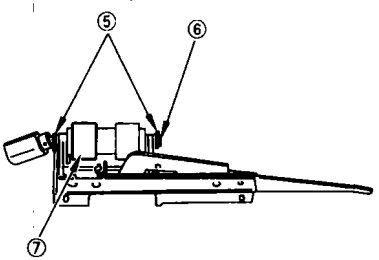


Figure 4-3026


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## 10. Adjusting the Separation Roller Pressure

1) Remove the cassette 1/2/3/4 pick-up assembly.
2) Remove the screw ②, and remove the lower guide ①. (For the cassette 1 pick-up assembly, remove the pick-up assembly support plate first.)

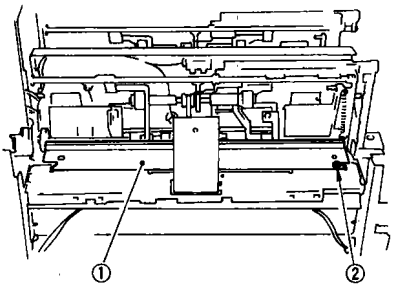


**Figure 4-3027**

3) If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the pressure spring ④ of the separation roller ③.
If double-feeding occurs, move the hook of the spring to A.
If pick-up failure occurs, move the hook of the spring to B.

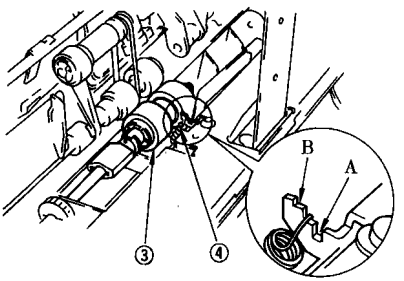


**Figure 4-3028**

## 11. Cassette 1/2/3/4/ Pick-Up Assembly Pick-Up Roller Releasing Solenoid

Keep the following in mind when attaching the solenoids (SL16, SL17, SL18, SL19).

While lifting the lever at the rear of the pick-up assembly, install the solenoid so that the pick-up roller arm ① butts against the upper stay ② when the plunger of the solenoid is forced in; see Figure 4-3028.

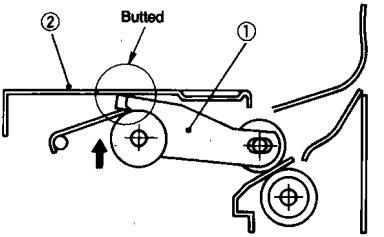


**Figure 4-3029**

## 12. Releasing the Lifter

If the lifter ① has moved up, push down the lifter releasing arm ② to move it down.

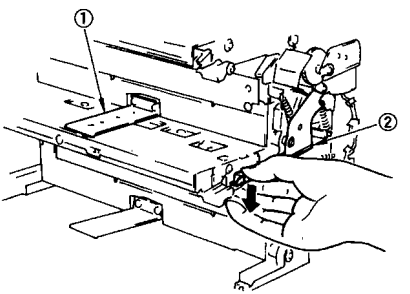


**Figure 4-3030**

### 13. Adjusting the Horizontal Registration of the Cassette

1) Remove the cassette from the holder you want to adjust.
2) Turn the adjusting screw ① to adjust the horizontal registration plate so that the horizontal registration on the copy image is 2 ±1 mm.

To increase the registration at the front,

↓

Turn the adjusting screw counterclockwise (a single turn will lead to a change of about 0.7 mm).

To increase the registration at the rear,

↓

Turn the adjusting screw clockwise (a single turn will lead to a change of about 0.7 mm).

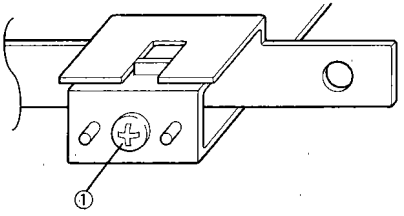


Figure 4-3031

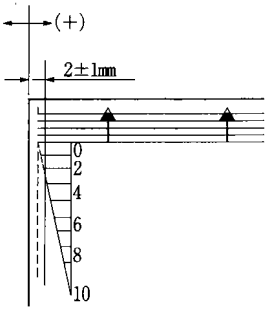


Figure 4-3032

## B. Multifeeder Assembly

### 1. Detaching the Multifeeder Assembly

1) Remove the pick-up assembly.
2) Remove the reader controller PCB cover, multifeeder cover, upper right cover, and center right cover.
3) Disconnect the connector ①, and remove the four screws ②; then, open the pick-up assembly door, and remove the multifeeder assembly.

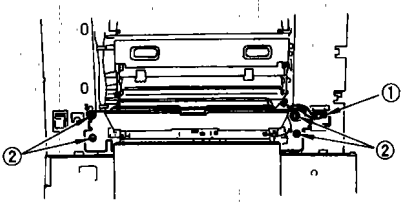


Figure 4-3033

### 2. Detaching the Multifeeder Pick-Up Roller

1) Remove the E-ring ① (made of resin), and carefully pull out the pick-up roller ②.

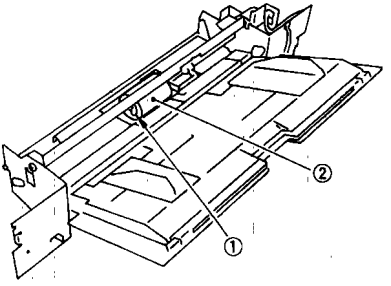


Figure 4-3034

**Caution:**
The pick-up roller is fixed to the shaft with a parallel pin; take extra care not to drop it when detaching and attaching the roller.


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**Reference:**

When attaching the multifeeder pick-up roller ①, make sure that the side of the collar with a cross ② is toward the copier's rear.

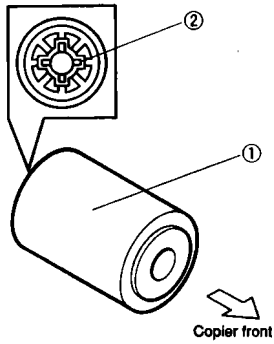


**Figure 4-3035**

## 3. Detaching the Separation Pad

1) Remove the multifeeder assembly.
2) Remove the screw ①, and remove the separation pad assembly ②.

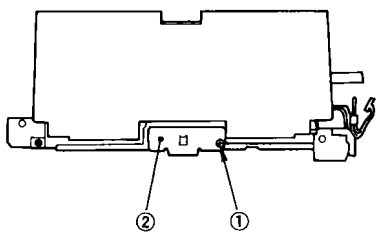


**Figure 4-3036**

**Caution:**

Manual Feed Separation Pad

If you have replaced the manual feed separation pad or the manual feed pick-up assembly, you must execute 'aging' in service mode.

(The pad found inside the machine has already been *aged* before shipment to ensure stable pick-up performance.)

Step

1) Make sure no copy paper is found in the manual feed assembly.
2) Activate service mode, and select 'FUNC' and then 'FMISC'.
3) Select 'MF-PAD'.
   - The manual feed pick-up roller rotates about 10 min and then stops.
4) Press the Reset key. (The work is finished when you leave service mode.)

## 4. Adjusting the Separation Pad Pressure

Adjust the position of the pressure spring of the separation pad if double-feeding or pick-up failure occurs during pick-up operation.

① If double-feeding occurs, move the spring holder in the direction of A, thereby increasing the spring tension.

② If pick-up failure occurs, move the spring holder in the direction of B, thereby decreasing the spring tension.

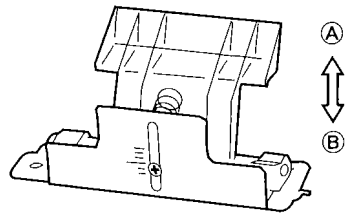


**Figure 4-3037**

## 5. Left/Right Registration

If the left/right registration is wrong when feeding from the multifeeder, loosen the screw ① to adjust the position of the tray.

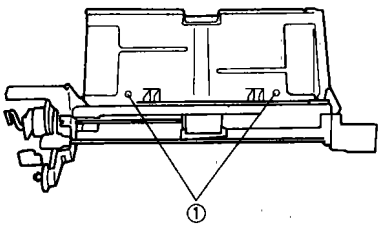


**Figure 4-3038**

## 6. Position of the Multifeeder Assembly Paper Guide Cam

Adjust the engagement and the control ring position of the 26T gear 1 and 26T gear 2 so that the paper guide plate and paper guide plate cam are positioned as shown in Figure 4-3039 when the solenoid plate is in contact with the claw of the control ring.

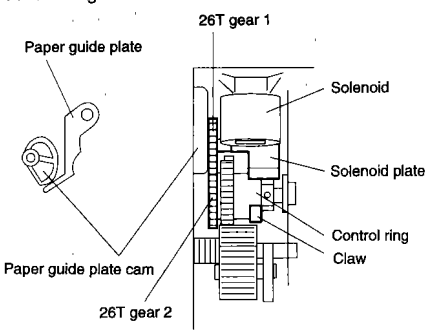


**Figure 4-3039**

## 7. Attaching the Timing Belt of the Multifeeder Assembly

Butt the rack plate of the multifeeder fully against A, i.e., in open position.

Move the slide volume into the direction of B, and install the timing belt to the pulley.

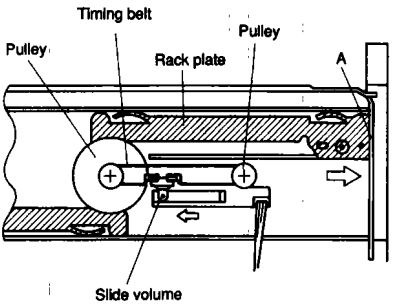


**Figure 4-3040**


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# C. No. 1 Feeding Assembly

## 1. Construction

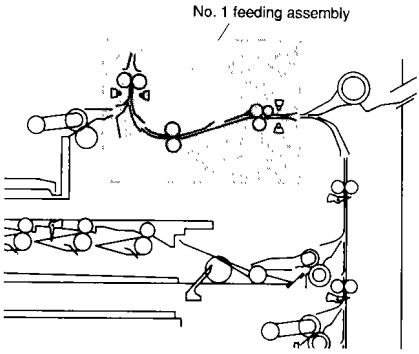


**Figure 4-3041**

## 2. Detaching the No. 1 Feeding Assembly

1) Pull out the transfer assembly frame.
2) Disconnect the two connectors ①, and remove the screw ②.

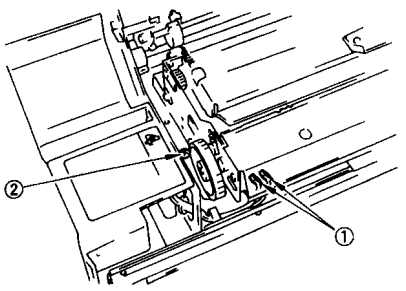


**Figure 4-3042**

3) Remove the No.1 feeding assembly while sliding it slightly to the front.

## 3. Replacing the Multifeeder Sensor (PS8)

1) Slide out the transfer assembly frame, and remove the screw ①; then, remove the lower hook of the transfer assembly lower right cover.

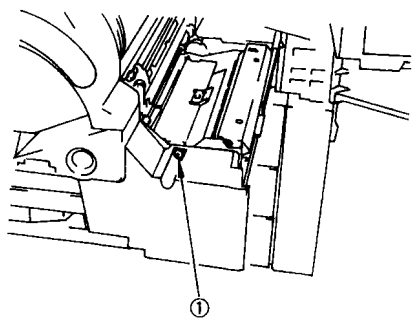


**Figure 4-3043**

2) Remove the screw ②, and remove the roller cover ③.

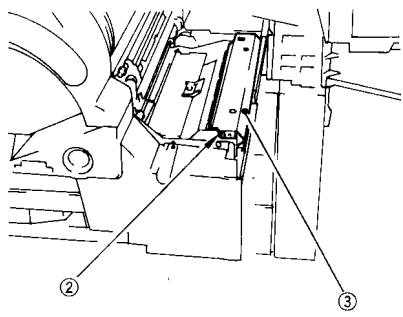


**Figure 4-3044**

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3) Disconnect the connector ④, and remove the screw ⑤; then, remove the multifeeder sensor (PS8) ⑥.

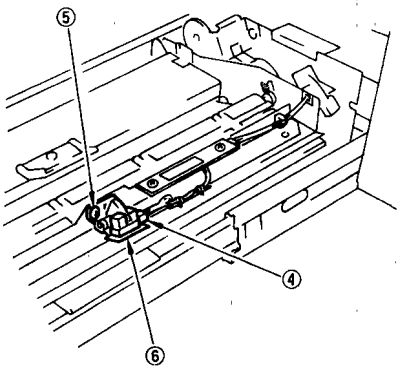


Figure 4-3045

## 4. Replacing the Light-Emitting Assembly PCB of the OHP Sensor (PS40)

1) Pull out the transfer assembly frame, and remove the screw ①; then, remove the lower hook of the transfer assembly lower right cover.

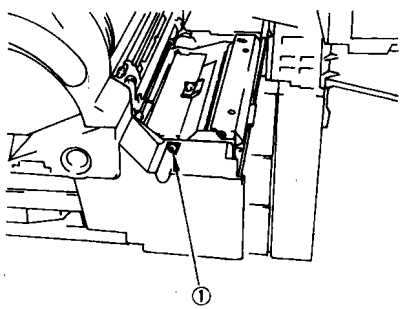


Figure 4-3046

2) Remove the screw ②, and remove the roller cover ③.

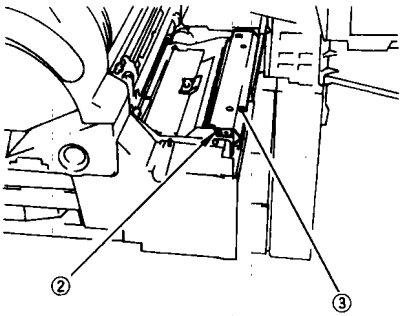


Figure 4-3047

3) Disconnect the connector ④, and remove the two screws ⑤; then, remove the light-emitting assembly PCB ⑥ of the OHP sensor (PS40).

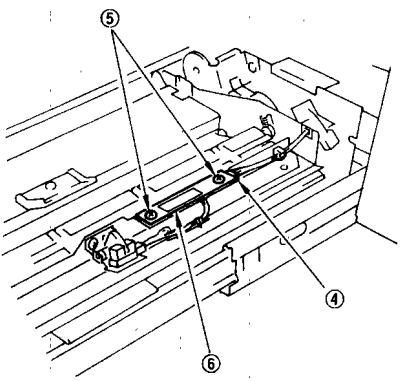


Figure 4-3048


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## 5. Replacing the Light-Receiving PCB of the OHP Sensor (PS40)

1) Slide out the transfer frame.
2) Disconnect the connector ①, and remove the screw ②; then, remove the light-receiving assembly PCB ③ of the OHP sensor (PS40).

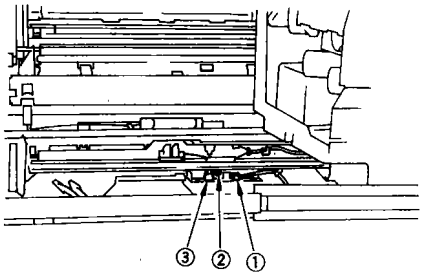


Figure 4-3049

## 6. Detaching the Pre-Registration Feeding Clutch (CL10)

1) Remove the No. 1 feeding assembly.
2) Remove the screw ①, and remove the roller cover ②.

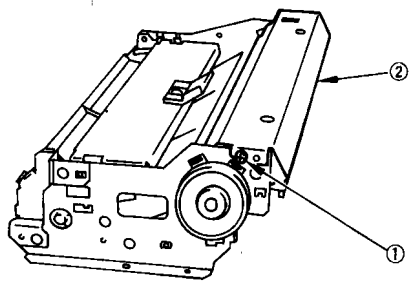


Figure 4-3050

3) Disconnect the connector ③, and remove the grip ring ④; then, remove the pre-registration feeding clutch (CL10) ⑤.

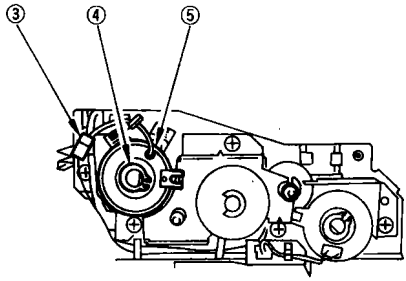


Figure 4-3051

## 7. Detaching the Manual Feed Feeding Clutch (CL11)

1) Remove the No. 1 feeding assembly.
2) Remove the screw ①, and remove the roller cover ②.

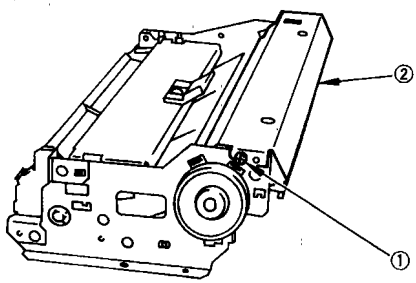


Figure 4-3052

3) Disconnect the connector ③, and remove the grip ring ④; then, remove the manual feed feeding clutch (CL11) ⑤.

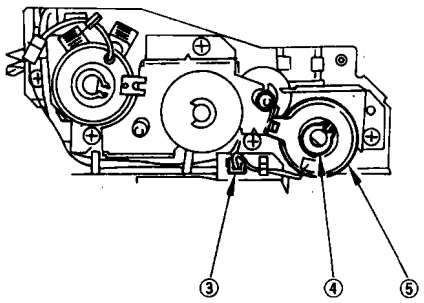


Figure 4-3053

## 8. Detaching the Retention Push-On Roller Unit

1) Slide out the transfer frame, and remove the transfer cover and transfer frame cover.
2) Remove the screw ① and the registration roller assembly fixing pin ②.

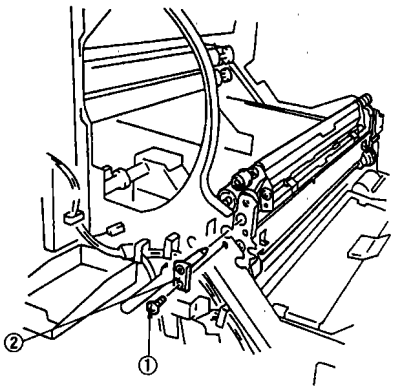


Figure 4-3054

3) Remove the screw ③, and remove the rear plate ④.

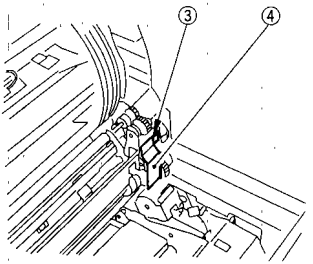


Figure 4-3055

4) Remove the retention push-on roller unit as shown in Figure 4-3056.

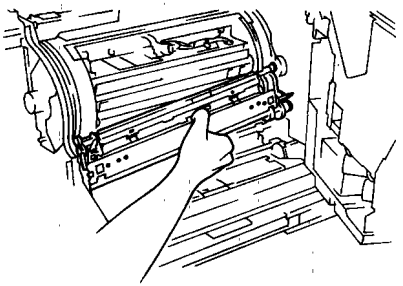

Figure 4-3056

**Caution:**
Take care so that the retention push-on roller unit or fingers will not come into contact with the transfer sheet.


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## 9. Detaching the Retention Smoothing Roller

1) Remove the retention smoothing roller unit.
2) Remove the E-ring ①, and remove the retention smoothing roller ②.

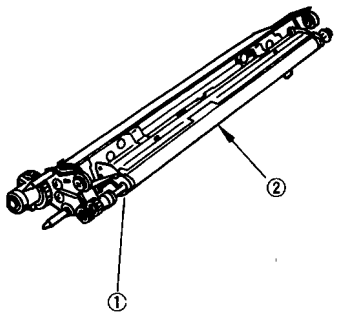


Figure 4-3057

## 10. Detaching the Scraper Unit of the Retention Smoothing Roller

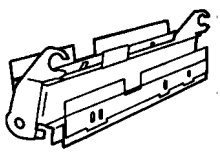

Figure 4-3058

1) Remove the retention push-on roller unit.
2) Remove the retention smoothing roller ①, and remove the two screws ②; then, remove the scraper unit ③.

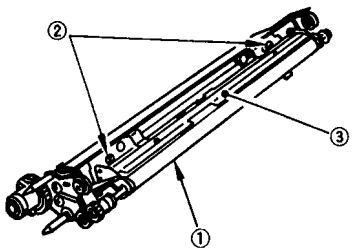


Figure 4-3059

## 11. Removing the Scrapers 1, 2, and 3 of the Retention Smoothing Roller

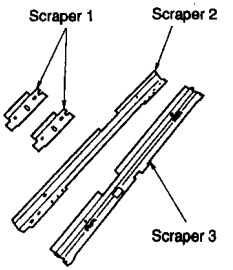


Figure 4-3060

**a. Removing the Scrapers 1 and 3**

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the spring ①, and remove the scraper 1 and 2 units. (TYPE 1)

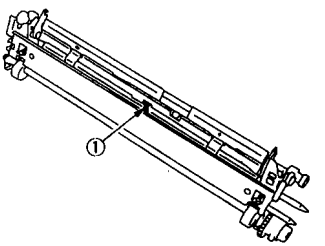


Figure 4-3061

Remove the scraper 1 and 3 units. (TYPE 2)

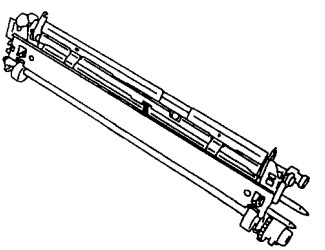

Figure 4-3062

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3) Remove the two screws ②, and remove the scrapers 1 and 3. (Keep in mind that the scraper 1 consists of two pieces; see the steps on how to remove the scraper 1.)

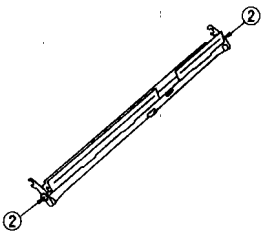


Figure 4-3063

**b. Removing the Scraper 2**

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the scraper 1 and 3 units.
3) Remove the two screws ③, and remove the scraper 2 ④.

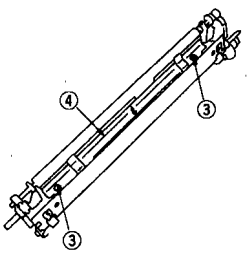


Figure 4-3064

**c. Removing the Scraper 1**

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the scraper 1 and 3 units.
3) Remove the two screws, and remove the scraper 2.
4) Remove the screw ⑤, and remove the scraper 1 ⑥.

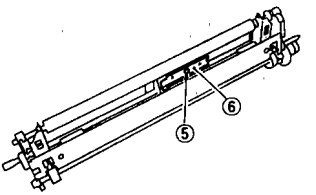


Figure 4-3065

## 12. Removing the Retention Smoothing Roller Guide Sheet

1) Remove the retention push-on roller unit, and remove the retention smoothing roller.
2) Remove the screw ①, and remove the guide sheet ②.

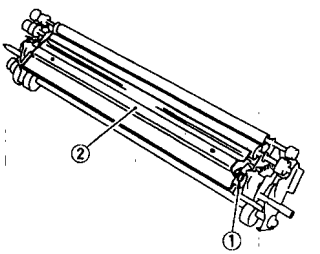


Figure 4-3066


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## 13. Detaching the Registration Clutch (CL9)

1) Put down the transfer drum, fixing assembly, and transfer assembly frame.
2) Remove the retention push-on roller unit.
3) Disconnect the connector ①, and remove the screw ② and grip ring ③; then, remove the registration clutch (CL9).

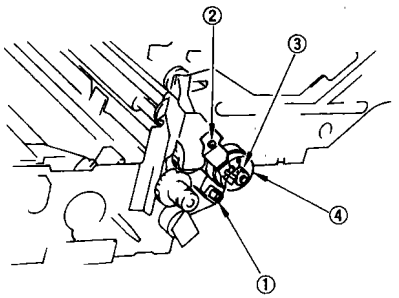


Figure 4-3067

## 14. Detaching the Registration Roller

1) Remove the registration clutch.
2) Remove the two screws ① and E-ring ②; then, remove the retention roller drive gear unit ③.

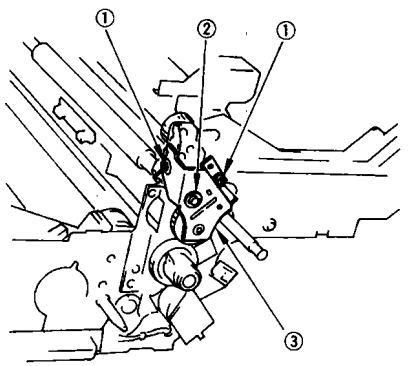


Figure 4-3068

3-1) Remove the roller pressure spring (rear) ④.

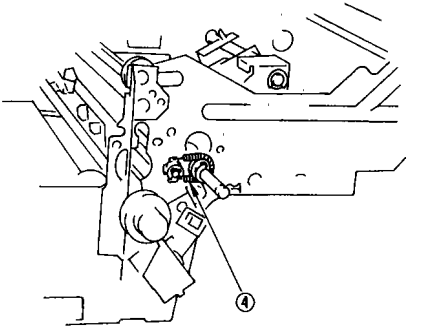


Figure 4-3069

3-2) Remove the three E-rings ⑥ ⑦ from the registration metal roller ⑤.

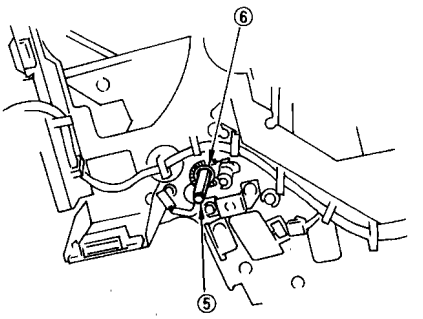


Figure 4-3070 (front)

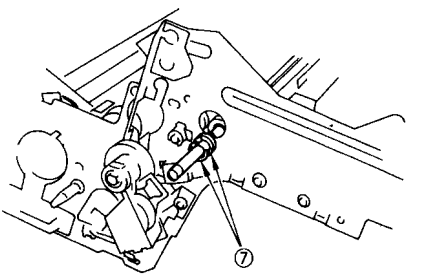


Figure 4-3071 (rear)

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4) Pull out the registration metal roller ⑤ as shown in Figure 4-3072.

**Caution:**
The OHP sensor is found under the registration metal roller; take care not to bring the roller in contact with the sensor.

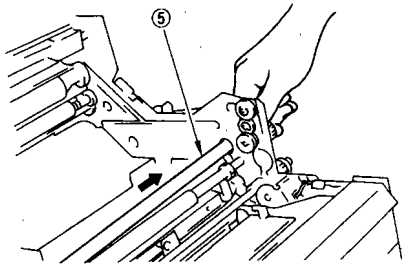


**Figure 4-3072**

5) Remove the E-ring ⑥ and washer ⑦; then, pull out the bushing ⑧.

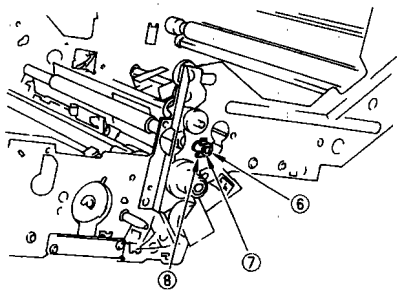


**Figure 4-3073**

6) While holding the releasing lever ⑨ with one hand, move the roller shaft ⑩ to the right (arrow direction) and pull it off toward the front.

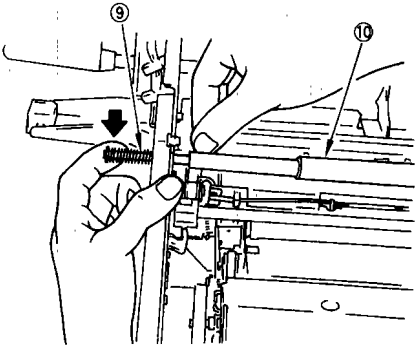


**Figure 4-3074**

7) Remove the E-ring ⑪ and two washers ⑫, and remove the spring ⑬.

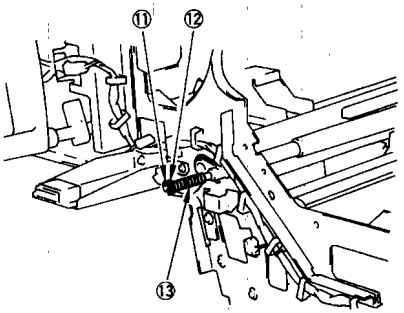


**Figure 4-3075**


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8) Remove the roller pressure spring (front) ⑭.

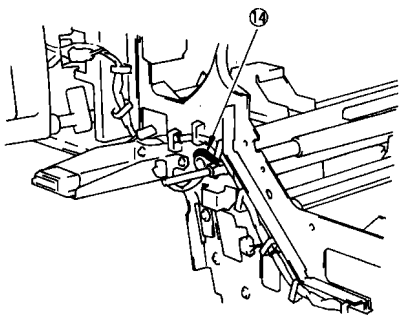


**Figure 4-3076**

9) Pull out the registration rubber roller ⑮ as shown in Figure 4-3077.

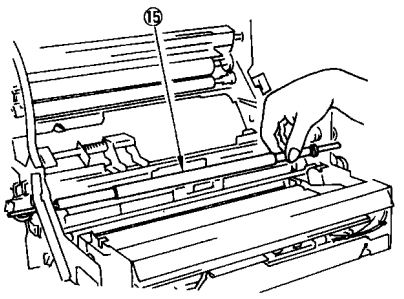


**Figure 4-3077**

## 15. Detaching the Registration Releasing Solenoid (SL9)

1) Put down the transfer drum, fixing assembly, and transfer assembly frame.
2) Remove the No. 1 feeding assembly.
3) Disconnect the connector ①, and remove the screw ②; then, remove the registration pressure solenoid ③.

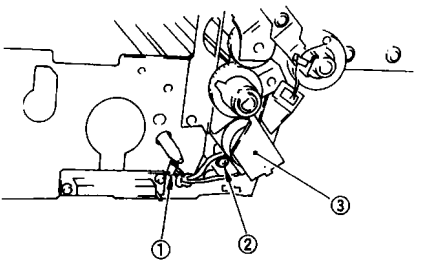


**Figure 4-3078**

# D. No. 2 Feeding Assembly

## 1-1. Detaching the Feeding Belt (TYPE 1)

1) Pull out the transfer assembly frame, and put down the fixing assembly.
2) Remove the screw ①, and remove the feeding belt unit ②.

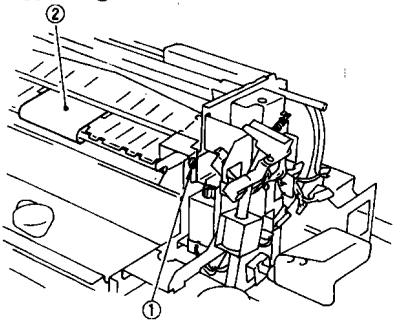


**Figure 4-3079**

3) Remove the four screws ③, and pull out the guide plate ④.

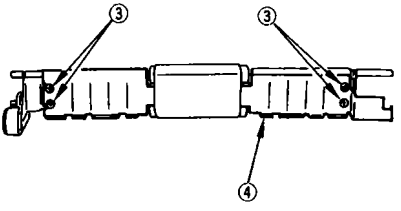


**Figure 4-3080**

4) Remove the feeding belt drive roller ⑤, and remove the feeding belt ⑥.

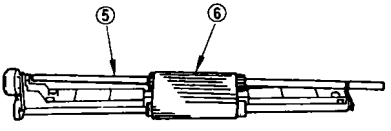


**Figure 4-3081**

## 1-2. Removing the Feeding Belt (TYPE 2)

1) Draw out the transfer assembly frame, and take out the fixing assembly.
2) Remove the screw, and take out the feeding belt unit.
3) Remove the E-ring ①, and remove the feeding belt drive roller ②.
4) Remove the feeding belt ③.

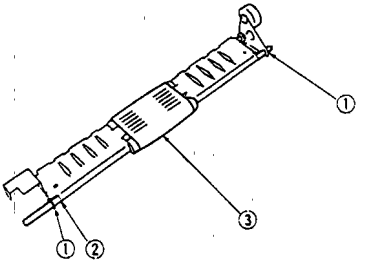


**Figure 4-3082**


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# E. Transfer Drum Assembly

## 1. Construction

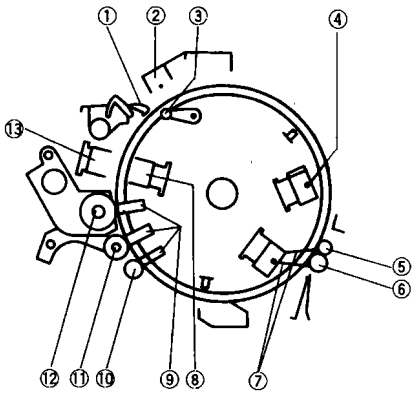


**Figure 4-3083**

① Separation claw
② Separation corona assembly
③ Separation push-up spacer
④ Transfer brush
⑤ Retention smoothing roller
⑥ Retention roller
⑦ Retention brush
⑧ Internal static eliminator
⑨ Transfer push-on brush
⑩ Transfer polishing roller
⑪ Transfer oil removing roller
⑫ Transfer drum cleaner
⑬ External static eliminator

## 2. Detaching the Retention/Retention Smoothing Brush

1) Shift the pressure lever to the right to release.
2) Remove the screw ①, and pull out the retention/retention smoothing brush.

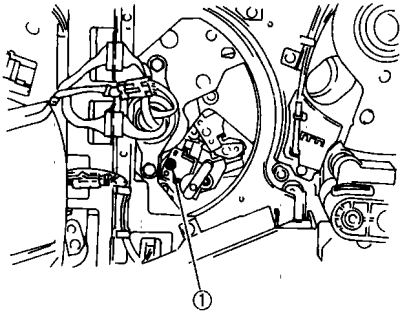


**Figure 4-3084**

## 3. Detaching the Transfer Brush

1) Shift the pressure lever to the right to release.
2) Remove the screw ①, and pull out the transfer brush.

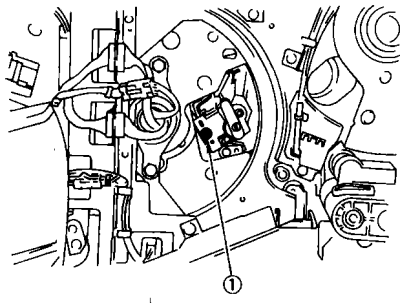


**Figure 4-3085**

## 4. Detaching the External Static Eliminator

1) Remove the screw ①, and pull out the external static eliminator ②.

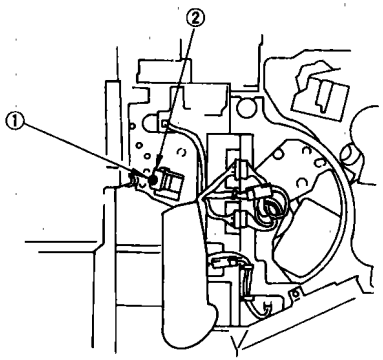


Figure 4-3086

## 5. Detaching the Transfer Drum

**Caution:**

The one-way clutch is in its active position when the transfer drum is on the transfer assembly frame; do not turn the transfer drum with your fingers inside the transfer drum.

Moreover, do not turn it when the transfer drum is off the transfer assembly frame; the transfer drum would rotate in reverse, damaging the transfer brush or retention brush.

You must make the following adjustments in service mode (FUNC, ATTRACT) whenever you have replaced the transfer drum:

1 retention position (ATT-TA, ATT-TB)
2 image leading edge margin (RG-XA, RG-XB, RG-Y)
3 transfer delay (TR-DELAY)

1) Open the hopper, and remove the transfer frame cover; then, pull out the transfer frame.
2) Disconnect the connector ① for the separation sensor, three connectors ② for the transfer drum, and the connector ③ for the polishing roller motor.

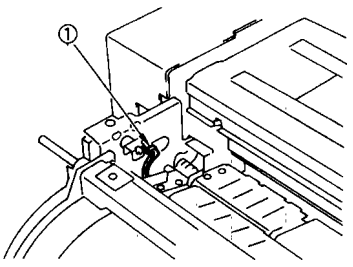


Figure 4-3087

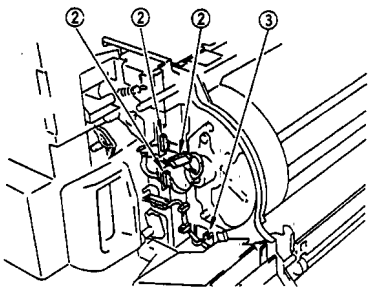


Figure 4-3088


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3) Remove the two screws ④, and release the transfer assembly metal fixing.
4) Remove the two screws, and remove the grip.
5) Remove the screw ⑥, and remove the transfer assembly metal fixing ⑦ (binding screw); then, rotate the transfer frame metal fixing toward the front.

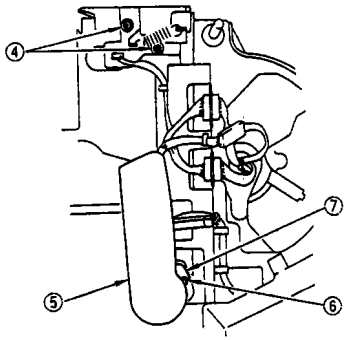


**Figure 4-3089**

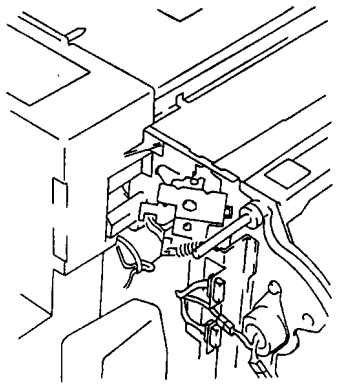

**Figure 3-3090 (rotated)**

6) Hold the rear of the transfer drum with one hand, and lift the transfer drum by holding its grip with the other hand.

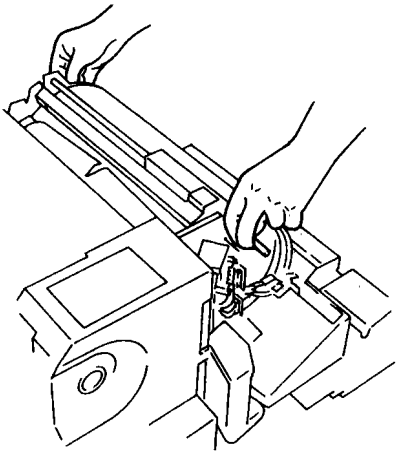

**Figure 4-3091**

**Caution:**
Take care not to bring the retention roller in contact with the transfer drum sheet.

7) Place the transfer drum as shown in Figure 4-3092.

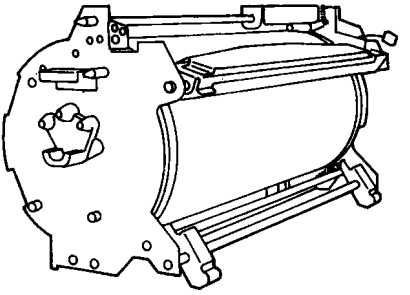

**Figure 4-3092**

## 6. Points to Note When Attaching the Transfer Drum

- After placing the transfer drum on the transfer assembly frame, check that it is seated as shown in Figure 4-3093.

Correct

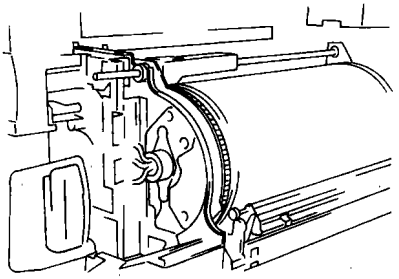

Figure 4-3093

Wrong

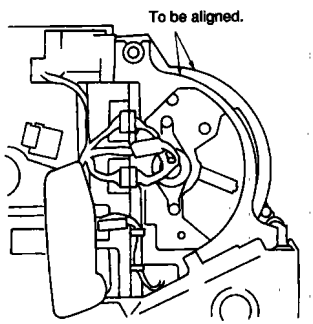


Figure 4-3094

## 7. Detaching the Internal Static Eliminator

1) Put down the transfer drum from the transfer assembly frame.
2) Rotate the transfer drum so that the hole in the rear plate of the transfer drum and the hole in the transfer drum are matched.
3) Remove the screw ①, and pull out the internal static eliminator ②.

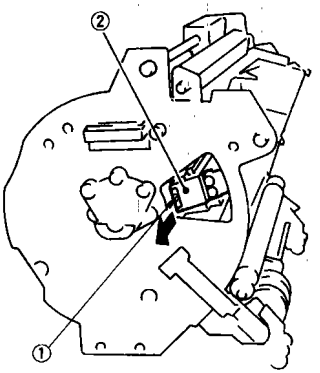


Figure 4-3095

## 8. Detaching the Separation Corona Assembly

1) Pull out the transfer assembly frame.
2) Remove the screw ①, and remove the separation corona assembly ②.

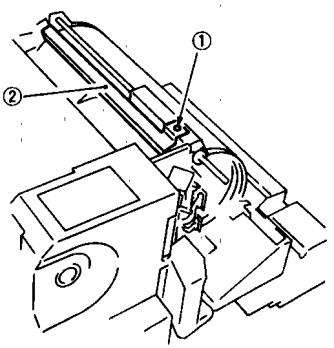


Figure 4-3096


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## 9. Detaching the Separation Sensor

1) Pull out the transfer assembly frame.
2) Put down the transfer drum unit.
3) Remove the two screws ①, and remove the separation guide ②.

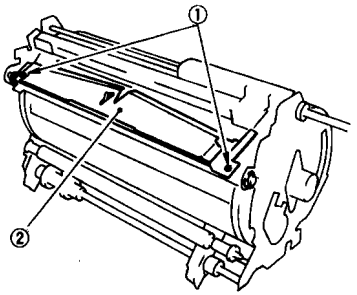


**Figure 4-3097**

4) Remove the two screws, and disconnect the connector; then, remove the sensor.

## 10. Removing the Separation Claw

1) Pull out the transfer frame.
2) Remove the two screws, and remove the separation guide. (See Figure 4-3097.)
3) Remove the screw, and remove the separation claw.

**Caution:**
If the separation claw assembly and the transfer drum assembly do not fit well after replacing the separation claw or if separation faults occur, adjust the position of the separation claw.

## 11. Replacing the Transfer Drum Sheet

**a. Detaching the Transfer Drum Sheet**

1) Open the front door, and slide out the hopper; then, open it 180°.
2) Pull out the transfer assembly frame.
3) Put down the transfer drum from the transfer assembly frame.
4) Remove the four screws ①, and remove the transfer drum side scraper ②.

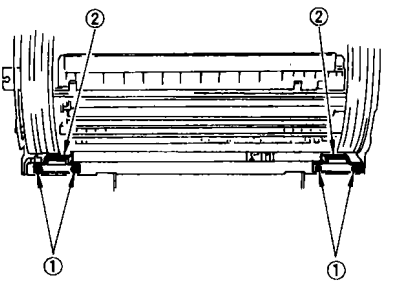


**Figure 4-3098**

5) Peel the trailing edge of the transfer drum sheet and keep the edge off the drum.

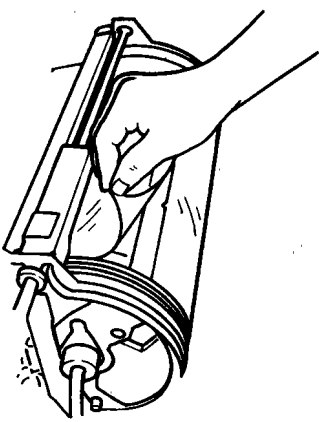

**Figure 4-3099**

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6) Peel the leading edge of the transfer drum sheet.

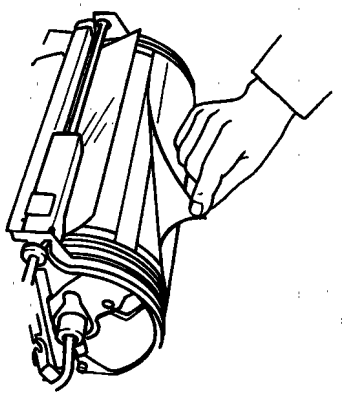

Figure 4-3100

7) Remove the transfer drum sheet by picking up its leading edge.

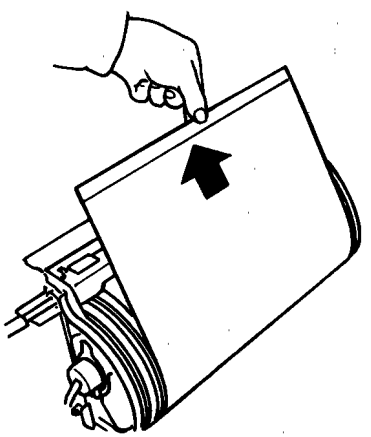

Figure 4-3101

**Caution:**
If adhesive remains on the ring of the transfer drum, be sure to remove it completely.

**b. Attaching the Transfer Drum Sheet**

**Caution:**
Do not touch the areas of the transfer drum sheet where copy paper will come into contact.

**Reference:**
1. Place copy paper (A3) on the transfer assembly frame to avoid damage to the transfer drum sheet.
2. Install the transfer drum sheet starting on the right side of the copier's front; starting from the front could place the sheet askew.

1) Clean the area of the transfer drum ring where tape will be used with alcohol.
2) Rotate the ring so that the ring connecting plate ③ is positioned as shown in Figure 4-3102.

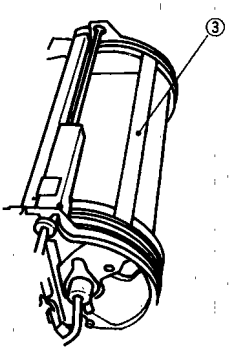


Figure 4-3102


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3) Peel the adhesive tape from the leading edge of the transfer drum sheet, i.e., the end along which holes are made in the sheet.
4) Align the holes of the transfer drum sheet with the holes in the connecting plate, and install the leading edge.

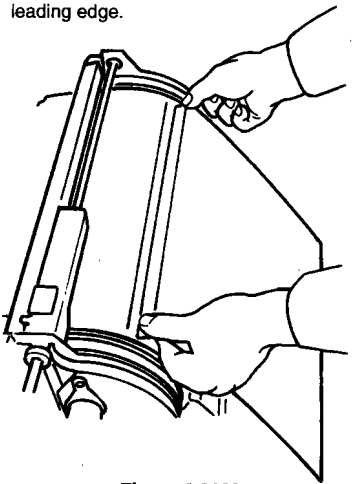

Figure 4-3103

5) Peel the adhesive tape for the transfer drum sheet.
6) Hold the trailing edge of the transfer drum sheet with one hand; let the sheet down on its own weight, and attach the sheet while turning the ring at the front of the transfer drum.

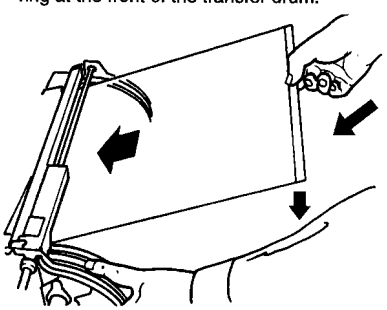

Figure 4-3104

**Caution:**
Make sure that the gap between the leading and trailing edges of the transfer drum sheet is 0 ±1.5 mm when attachment is complete.

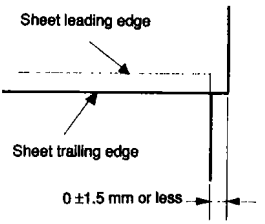


Figure 4-3105

7) While pressing the leading edge of the transfer drum sheet, install the sheet as if to tap it from its middle to its ends.

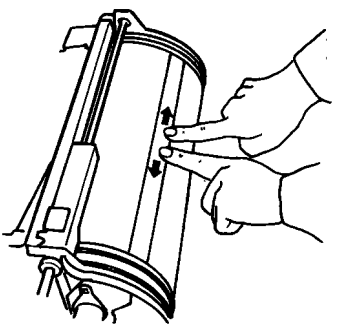

Figure 4-3106

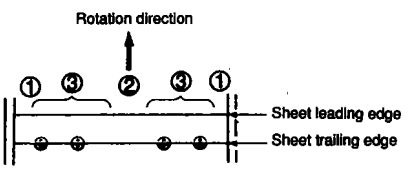


Figure 4-3107

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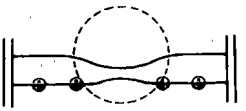

Figure 4-3108

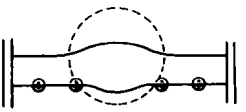

Figure 4-3109

**Caution:**
Make sure that the center of the transfer drum sheet is free of warps or slack.
A warp will cause the transfer drum sheet to come into contact with the photosensitive drum, in turn causing toner to fuse onto the photosensitive drum and triggering cleaning faults.
Slack, on the other hand, can trigger transfer faults or color displacement.

8) Run fingers along the adhesive tape on the transfer drum sheet once again to ensure proper adhesion.
9) Check the transfer drum for scratches, dents, and slack.
10) Slide the transfer frame into the copier.
11) Turn on the copier, and execute the following:
- Activate service mode, and select 'TCLN' under 'FUNC'.
- Press 'KCLN'.
- Make sure that the transfer drum and the polishing roller rotate and the indication <P> on the control panel display change from 'READY' to 'SERVICE' (about 3 min 30 sec), and then to 'READY'.
- The above operations complete the session.

**Caution:**
If you have replaced the transfer sheet or the transfer drum unit in the field, have the machine polish the surface of the transfer sheet using service mode. (The transfer sheet that comes with the machine have been polished before shipment; you will find fine lines on the sheet left by the operation.) Executing the polishing operation will serve to prevent adhesion of silicone oil from the 1st side of a two-sided copy to the surface of the transfer sheet when making two-sided copies either in auto or manual mode.
Steps
1) Activate service mode.
2) Select 'FUNC' and then 'TCLN'.
3) Select 'KCLN'.
- The polishing roller will rotate for about 4 min and will stop automatically.

4) Press the Reset key; the work is ended when you leave service mode.

## 12. Detaching the Separation Push-Up Solenoid

1) Slide out the transfer frame, and remove the transfer drum.
2) Remove the four screws ①, and remove the two transfer sheet scrapers ②.

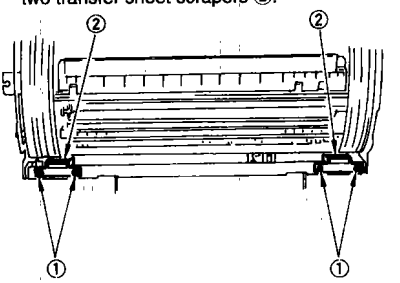


Figure 4-3110


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3) Peel the transfer sheet.
4) Disconnect the connector ③, and remove the spring ④.

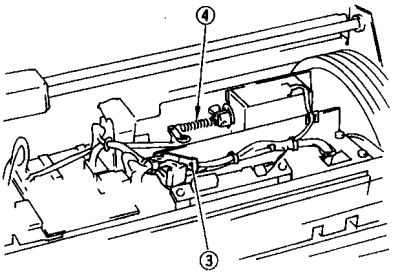


**Figure 4-3111**

5) Remove the E-ring ⑤ from the transfer drum front plate.

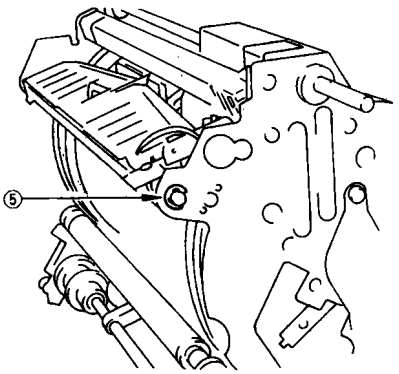


**Figure 4-3112**

6) Remove the E-ring ⑥ from the transfer drum rear plate, and remove the separation claw unit.

**Caution:**
Take note of the separation claw unit.

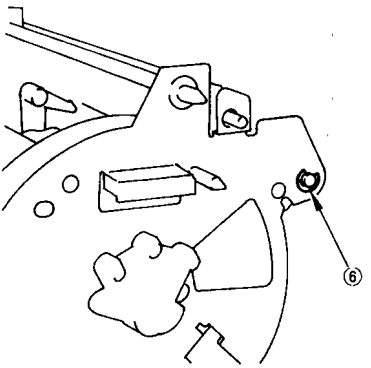


**Figure 4-3113**

7) Remove the two screws ⑦, and remove the separation push-up solenoid ⑧.

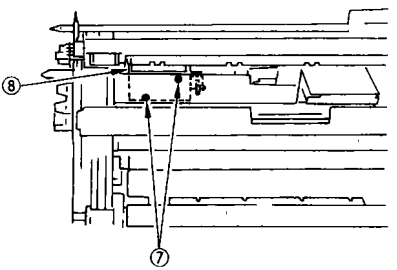


**Figure 4-3114**

## 13. Detaching the Brush Drive Motor (M11)

1) Slide out the transfer assembly frame, and remove the transfer drum.
2) Remove the four screws ①, and remove the two transfer sheet scrapers ②.

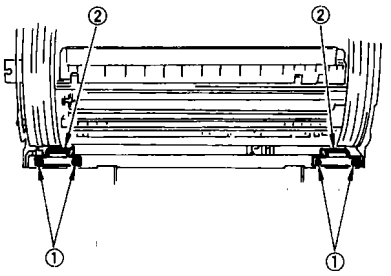


Figure 4-3115

3) Remove the transfer sheet.
4) Disconnect the connector ③, and remove the two screws ④; then, remove the brush drive motor.

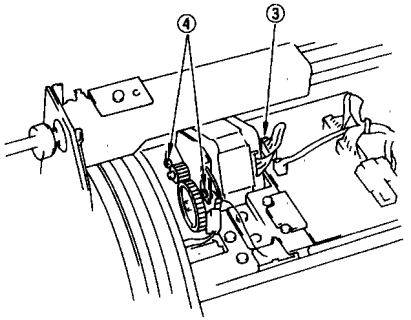


Figure 4-3116

## 14. Detaching the Brush Drive Motor Home Position Sensor

1) Remove the transfer drum.
2) Remove the transfer sheet.
3) Disconnect the connector ①, and remove the screw ②; then, remove the brush drive motor home position sensor ③.

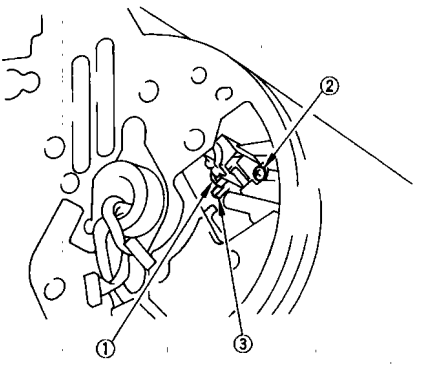


Figure 4-3117

## 15. Detaching the Transfer Drive PCB

1) Slide out the transfer assembly frame, and remove the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Disconnect the six connectors ①, and remove the five screws ②; then, remove the transfer driver PCB.

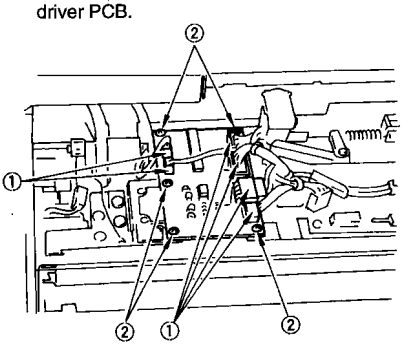


Figure 4-3118


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## 16. Detaching the Side A Sensor

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Disconnect the connector ①, and disengage the clip from behind the sensor mount; then, remove the A side sensor ②.

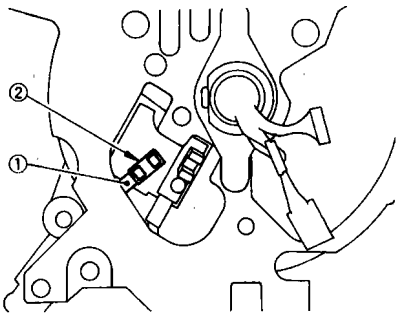


**Figure 4-3119**

## 17. Detaching the B Side Sensor

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Disconnect the connector ①, and remove the screw ②; then, remove the B side sensor ③.

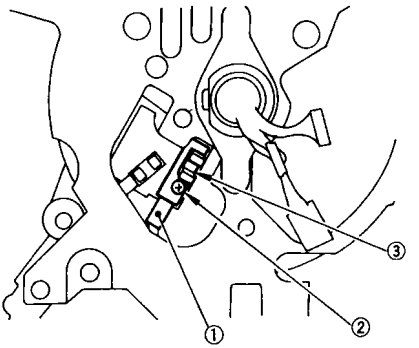


**Figure 4-3120**

## 18. Detaching the Separation Push-Up Spacer

1) Slide out the transfer assembly frame, and put down the transfer drum.
2) Remove the four screws, and remove the two transfer sheet scrapers.
3) Remove the transfer sheet.
4) Remove the separation push-up spacer ①.

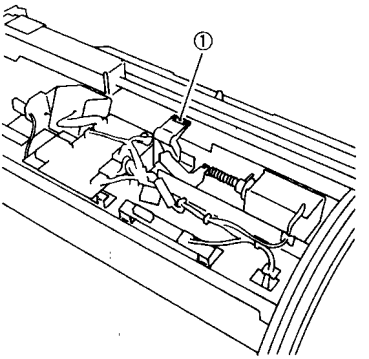


**Figure 4-3121**

# F. Transfer Assembly Frame

## 1. Detaching the Transfer Assembly Frame

1) Pull out the transfer assembly frame.
2) Put down the fixing assembly.
3) Put down the transfer drum.
4) Take out the transfer frame by holding its grips.

**Caution:**
The transfer assembly frame weighs about 10 kg; take care when moving it.

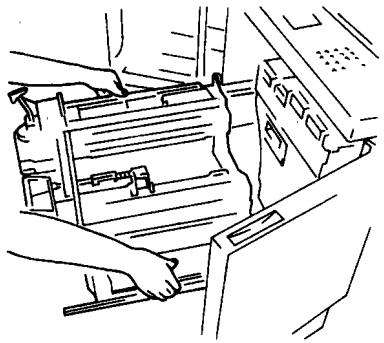

**Figure 4-3122**

## 2. Detaching the Registration Roller Assembly

1) Pull out the transfer assembly frame.
2) Remove the screw ① and the registration roller assembly fixing pin ②.

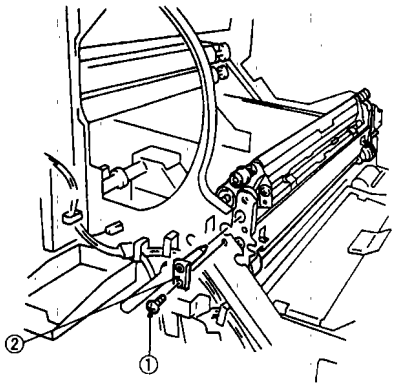


**Figure 4-3123**

3) Remove the registration roller assembly.

**Caution:**
1. Take care not to bring the gears and the like of the registration roller assembly into contact with the transfer sheet.
2. Do not hold the roller assembly or scraper assembly with fingers or the like.


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# G. Delivery Assembly

## 1. Detaching the Delivery Assembly

1) Remove the upper left cover.
2) Remove the delivery assembly upper cover.
3) Remove the four screws ①, and disconnect the two connectors ②.

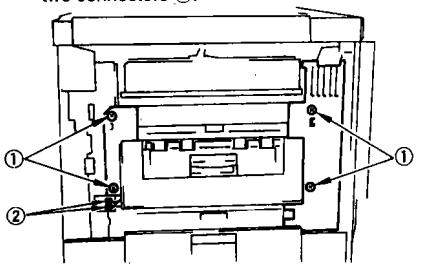

Figure 4-3124

4) Slide out the delivery assembly with care.

## 2. Positioning the Delivery Assembly Paper Deflector Drive Solenoid (SL20)

1) Remove the delivery assembly.
2) Place the delivery assembly on a level surface.
3) Keep the paper deflecting plate ② so that it butts against the delivery assembly upper guide ③ while viewing the delivery assembly from its side (rear) when the solenoid ① is on; then, loosen the adjusting screw ④ to make adjustments.

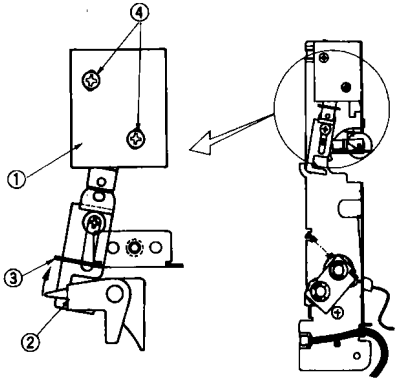

Figure 4-3125

# H. Duplexing Reversing Assembly

## 1. Detaching the Duplexing Reversing Assembly

1) Remove the upper left cover.
2) Remove the lower left cover.
3) Slide out the duplexing unit.
4) Remove the six screws ①, and disconnect the three connectors ②.

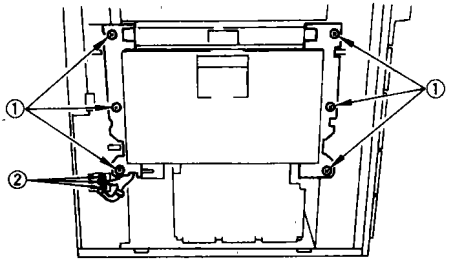

Figure 4-3126

5) Slide the reversing unit slowly to remove.

## 2. Detaching the Duplexing Reversing Assembly Switch-Back Motor (M17)

1) Remove the duplexing reversing assembly.
2) Open the duplexing reversing assembly door.
3) Remove the two screws ①.

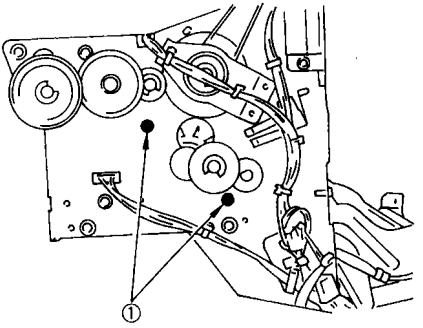

Figure 4-3127

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4) Disconnect the connector ②, and hold the duplexing reversing assembly switch-back motor ③; then, disengage the gear, and remove the motor.

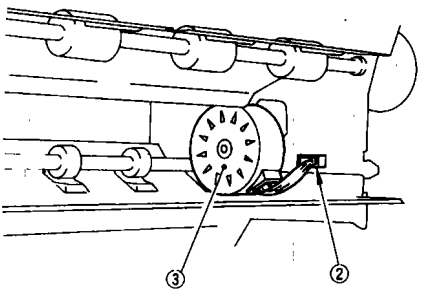


Figure 4-3128

## 3. Detaching the Duplexing Drive Clutch (CL22)

1) Remove the duplexing reversing assembly.
2) Disconnect the connector ①, and remove the screw ②.
3) Remove the C-ring ③.
4) Loosen the hex screw ④, and remove the duplexing drive clutch.

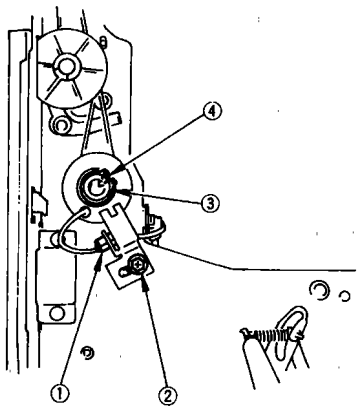


Figure 4-3129

## 4. Detaching the Duplexing Reversing Clutch (CL23)

1) Remove the rear cover.
2) Remove the screw, and open the DC controller PCB.
3) Remove the drive belt ① as shown in Figure 4-3130.

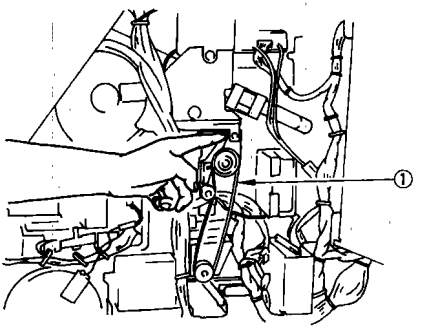


Figure 4-3130

4) Remove the three screws ②, and remove the gear cover.

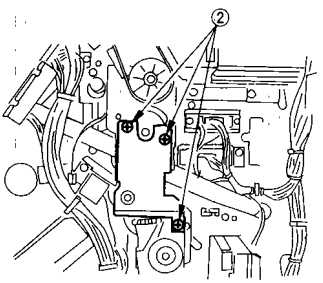


Figure 4-3131


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5) Disconnect the connector ③, and remove the two screws ④; then, shift the duplexing reversing clutch unit ⑤ to the right to remove.

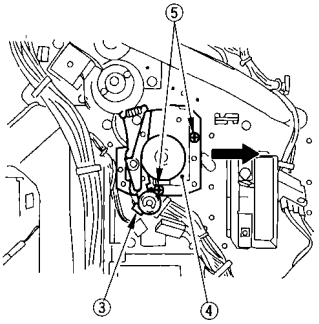


**Figure 4-3132**

6) Remove the two screws ⑤ of the duplexing reversing clutch unit; then, remove the clutch cover ⑥.

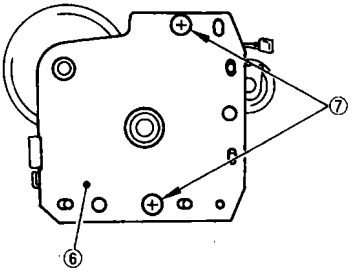


**Figure 4-3133**

7) Remove the bearing ⑦, and remove the E-ring ⑧ and C-ring ⑨, and loosen the hex screw ⑩.

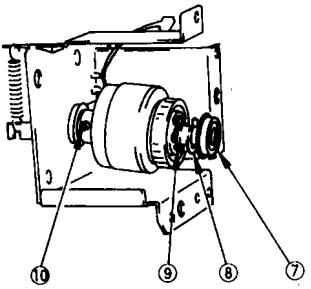


**Figure 4-3134**

8) Remove the duplexing reversing clutch.

# IV. EXPOSURE SYSTEM

## A. Scanning System

### 1. Removing the Scanning Lamp

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the three screws ①, and remove the anti-deflection plate ②.

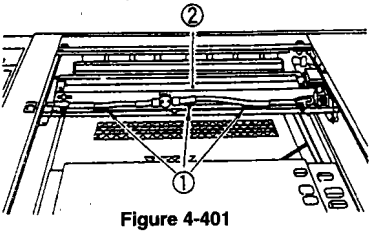


Figure 4-401

4) Turn a flat-blade screwdriver in the direction of the arrow ③ to open the electrode plate in the direction of the arrow ④ to remove the scanning lamp.

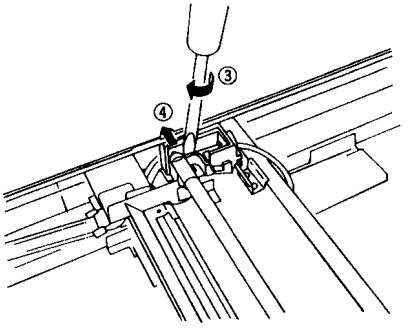


Figure 4-402

**Caution:**
1. Wait until the scanning lamp has cooled before starting the work.
2. Do not leave fingerprints on the scanning lamp.
3. If the surface of the scanning lamp is soiled, dry-wipe it.

### 2. Orientation of the Lamp

Hold the lamp so that the bump ① in the middle is in the direction of the arrow; lengthwise, put the lamp with the logo mark toward the rear.

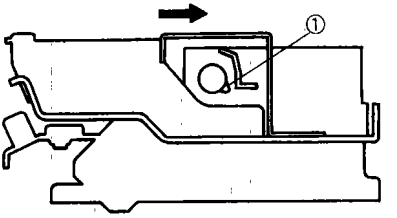


Figure 4-403

**Caution:**
Do not touch the lamp with your fingers when handling it.

### 3. Detaching the Standard White Plate

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the two screws ①, and remove the standard white cover ②.

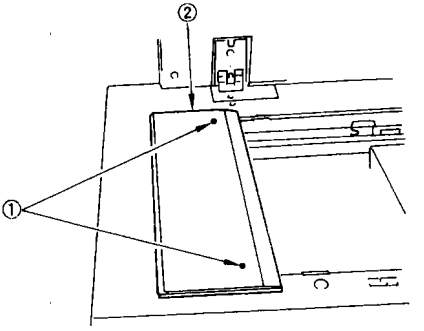


Figure 4-404


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4) Remove the two screws ③, and remove the standard white plate ④.

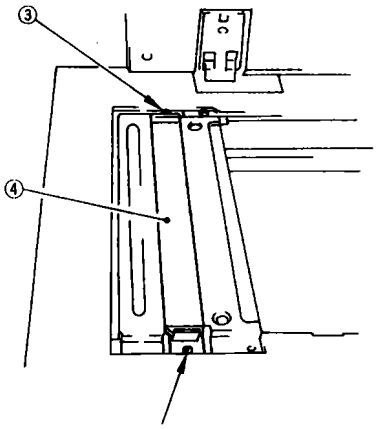


Figure 4-405

## 4. Detaching the Lens Mount Cover/ CCD Cover/CCD Unit

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the four screws, and remove the lens mount cover.

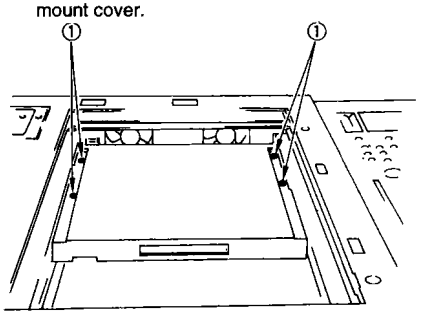


Figure 4-406

4) Remove the CCD cover ②.

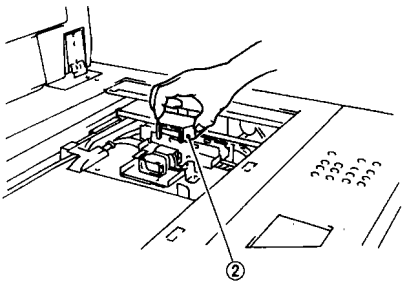


Figure 4-407

5) Remove the two screws ③, and remove the two CCD unit retaining springs ④.

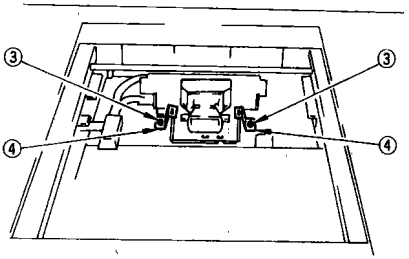


Figure 4-408

6) Lift the CCD unit, and disconnect the two connectors (J2001, J2003).

### 5. Detaching the Laser Scanner Cover

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the lens mount cover.
4) Remove the four screws ①, and remove the laser scanner cover ②.

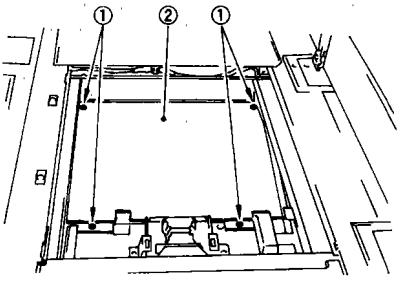


Figure 4-409

**Caution:**
Move the mirror mount fully to the left.
Take care not to damage the power line ③ of the scanning lamp.

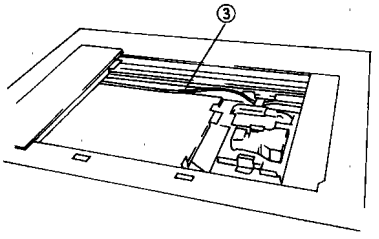


Figure 4-410

Cut-out at the Front
Remove in the direction of the arrow.

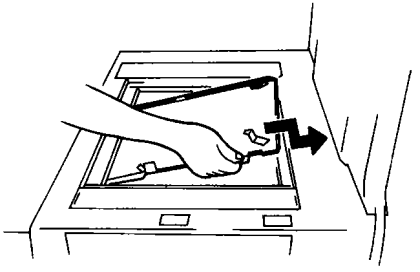

Figure 4-411

## B. Pre-Exposure Lamp

### 1. Detaching the Pre-Exposure Lamp

1) Put down the photosensitive drum.
2) Disconnect the connector ①, and remove the screw ②; then, remove the pre-exposure lamp unit.

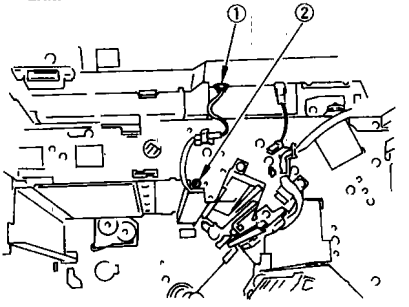


Figure 4-412


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# V. CHARGING SYSTEM

## A. Photosensitive Drum Assembly

### 1. Construction

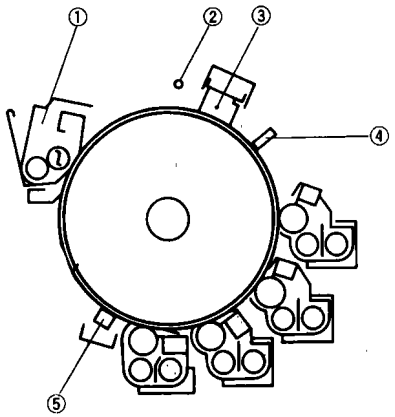


**Figure 4-501**

① Photosensitive drum cleaner
② Pre-exposure lamp
③ Primary corona assembly
④ Potential sensor
⑤ Black toner density sensor

### 2. Detaching the Photosensitive Drum

1) Turn off the power switch, and disconnect the power plug from the outlet.
2) Open the front door (left, right), and remove the two screws ①; then, remove the two hopper unit stopper fixings.

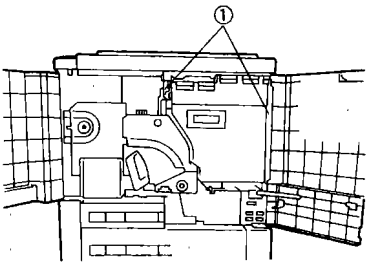


**Figure 4-502**

3) Open the hopper unit fully.
4) Remove the transfer drum rotating knob, and remove the transfer assembly cover.
5) Disconnect the connector ②, and remove the screw ③; then, slide out the primary corona assembly.

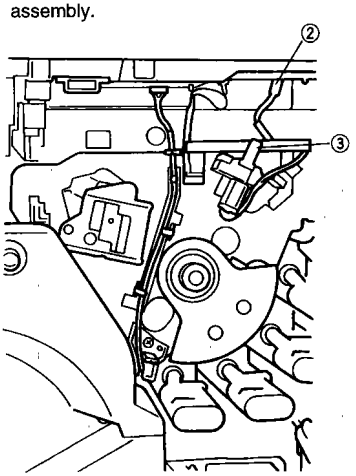


**Figure 4-503**

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6) Loosen the screw ④, and turn the releasing lever ⑤ clockwise until it stops; then, tighten the screw ④, and disengage the cleaning blade from the photosensitive drum.

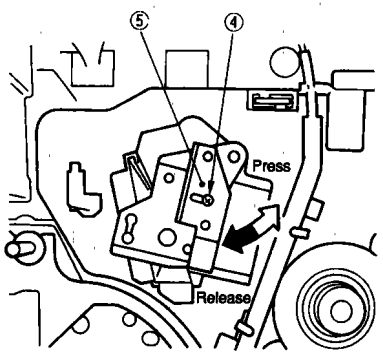


Figure 4-504

**Caution:**
Whenever installing the photosensitive drum cleaner unit, be sure to shift the blade releasing lever counterclockwise (locking position) and fix it securely in place with a screw.
Further, you must not engage the blade releasing lever (ON) after removing the cleaning unit.

7) Remove the screw ⑥; then, slide the cleaning unit ⑦ slightly out, and tilt it to the left; then, slide it fully out to the front.

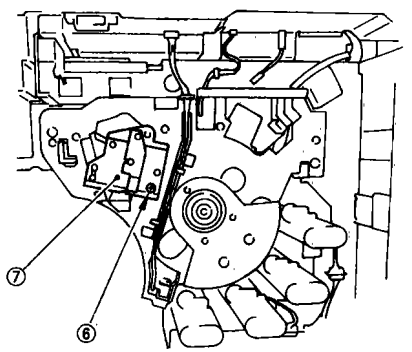


Figure 4-505

8) Remove the screw ⑧, and disconnect the connector ⑨; then, remove the pre-photosensitive drum cleaner paper sensor ⑩.

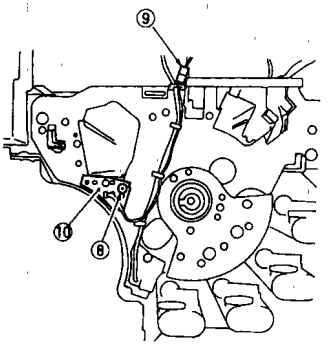


Figure 4-506

**Caution:**
When inserting the pre-photosensitive drum cleaner into the copier, be sure to guide it straight along the rail so as to avoid damage to the photosensitive drum.

9) Disconnect the connector ⑫ of the black toner density sensor unit ⑪, and remove the screw ⑬; then, remove the black toner density sensor.

10) Remove the screw ⑭, and remove the photosensitive drum fixing spacer ⑮.

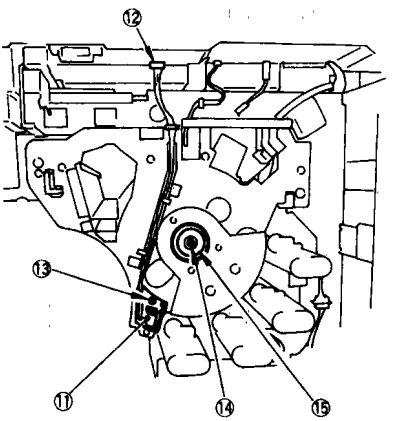


Figure 4-507


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11) Remove the three screws ⑯, and loosen the two fixing pins ⑰; then, slide out the photosensitive drum frame unit ⑱.

**Caution:**
When sliding out the photosensitive drum, take extra care to avoid damage; if resistance is felt at the front, lift it slightly. Make sure that the transfer assembly frame is inside the copier.

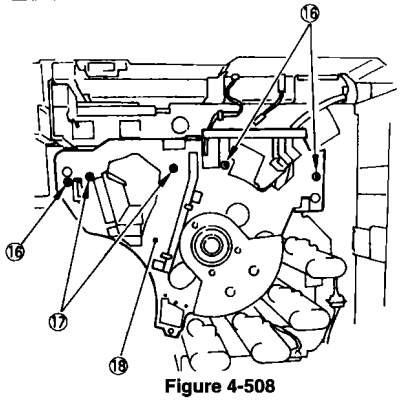


**Figure 4-508**

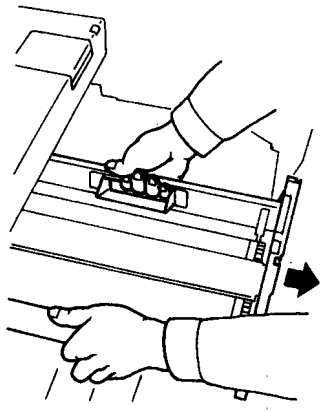

**Figure 4-509**

12) Hold the grip, and place it as shown in Figure 4-510.

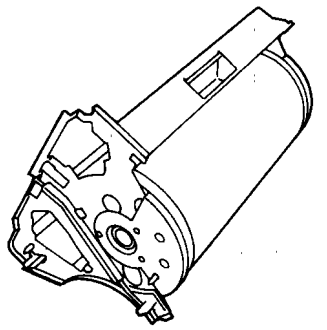

**Figure 4-510**

13) Remove the three screws ⑲, and remove the photosensitive drum block (front) ⑳.
14) Remove the three screws ㉑, and remove the photosensitive drum block (rear) ㉒.

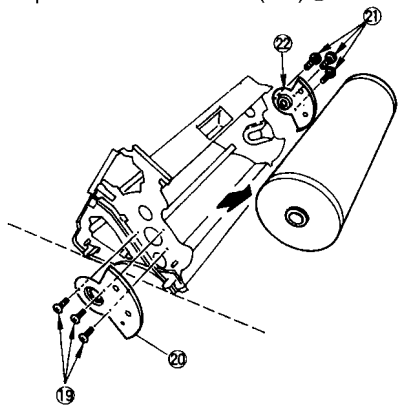


**Figure 4-511**

15) Slide out the photosensitive drum unit with care.

**Reference:**

Slide out the photosensitive drum unit as shown in Figures 4-512 and -513.

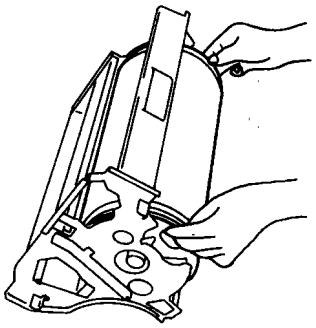

**Figure 4-512**

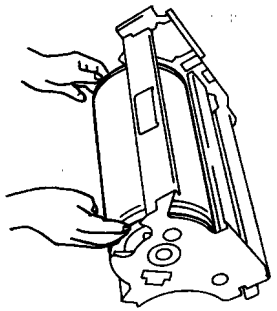

**Figure 4-513**

**Caution:**

The photosensitive drum is highly susceptible to light; if exposed to strong light for a long period of time, it may generate white spots or black band. Put the light-blocking sheet (or copy paper) around it and place it in a dark place whenever it has been removed from the copier.

16) Place the photosensitive drum unit with the drum heater friction plate at the bottom.
17) Remove the two screws ㉓, and remove the photosensitive drum flange (front) ㉔.

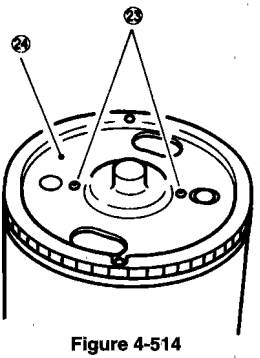


**Figure 4-514**

18) If the drum heater is installed, disconnect the connector ㉕, and pull out the drum heater ㉖.

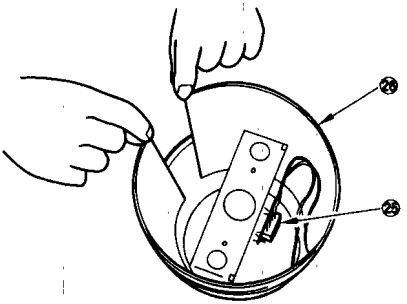


**Figure 4-515**

**Reference:**

The drum may recover to a degree that does not affect the copy quality if kept in a dark place for 24 hours after exposure to light of 600 lux; however, avoid exposing it to direct rays of the sun, which are as strong as 10,000 to 30,000 lux.


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19) Lift the photosensitive drum carefully as shown in Figure 4-516.

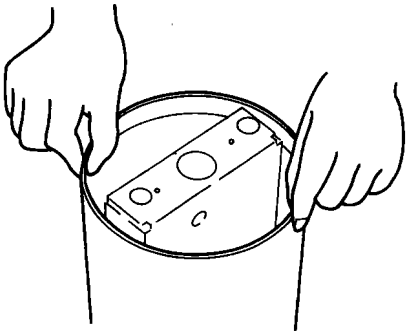

Figure 4-516

## 3. Cleaning the Photosensitive Drum

If the surface of the photosensitive drum is soiled, wipe it with a flannel cloth coated with toner; do not use paper, lint-free or otherwise.

**Caution:**
Do not dry wipe or do not use solvent; never use drum cleaning powder.

## 4. Replacing the Black Toner Density Sensor

1) Open the front right door.
2) Open the hopper.
3) Disconnect the connector, and remove the screw; then, remove the black toner density sensor unit.
4) Remove the two screws ①, and remove the black toner density sensor; then, disconnect the connector.

**Caution:**
Do not loosen any other screws than those shown, or the sensor will become displaced.

Figure 4-517

## 5. Detaching the Photosensitive Drum Cleaner Unit

1) Open the front door (left, right), and remove the screw; then, remove the hopper unit stopper fixing.
2) Open the hopper unit fully.
3) Loosen the screw, and turn the releasing lever ② clockwise until it stops; then, tighten the screw ①, and disengage the cleaning blade from the photosensitive drum.

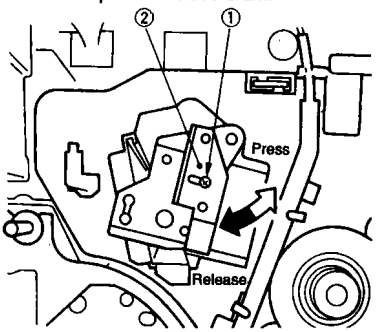


Figure 4-518

4) Remove the screw ④; then, slide the cleaning unit slightly out, and tilt it to the left; then, slide it fully out.

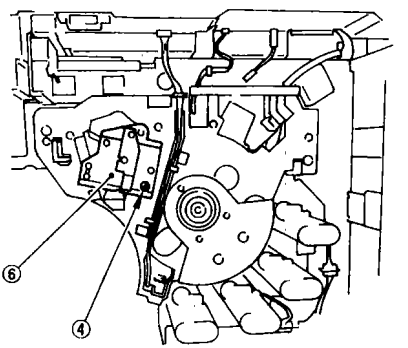


Figure 4-519

**Caution:**
Whenever installing the photosensitive drum cleaner unit, be sure to shift the blade releasing lever counterclockwise (locking position) and fix it securely in place with a screw.

**Caution:**
When inserting the photosensitive drum cleaner unit into the copier, be sure to guide it straight along the rail so as to avoid derailing it.
You must not engage the blade releasing lever (ON) after removing the cleaning unit.

## 6. Replacing the Photosensitive Drum Cleaner Blade

1) Remove the photosensitive drum cleaner unit.
2) Remove the two screws ①, and remove the photosensitive drum cleaner unit upper cover ②.

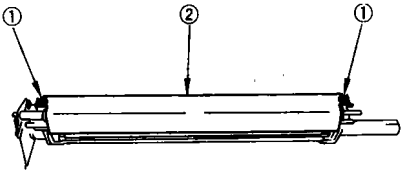


Figure 4-520

3) Remove the five screws ③, and remove the photosensitive unit cleaner blade.

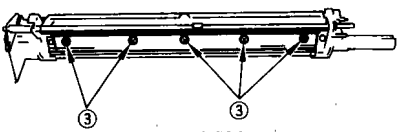


Figure 4-521

## 7. Replacing the No. 2 Blade

1) Open the front right door.
2) Open the hopper unit.
3) Disconnect the connector, and remove the screw; then, remove the black toner density sensor unit.
4) Remove the two screws ① of the No. 2 blade (front, rear); then, remove the No. 2 blade ②.

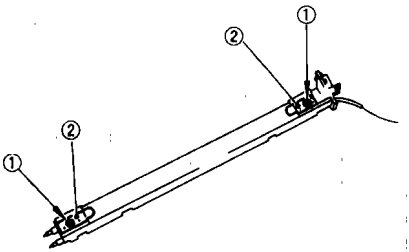


Figure 4-522

## 8. Replacing the Photosensitive Drum Scoop-Up Sheet

1) Remove the photosensitive drum cleaner unit.
2) Remove the three screws ①, and remove the photosensitive drum cleaner lower scraper ②.

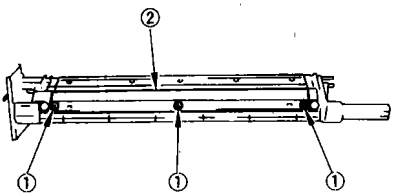


Figure 4-523

## 9. Detaching the Photosensitive Drum Cleaner End Seal (upper, lower)

1) Remove the photosensitive drum cleaner unit.
2) Remove the two screws ①, and remove the photosensitive drum cleaner unit upper cover ② when detaching the end seal (upper).

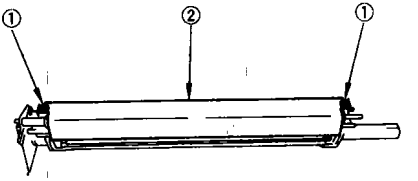


Figure 4-524

3) Remove the screws ③ to remove the end seal ④.

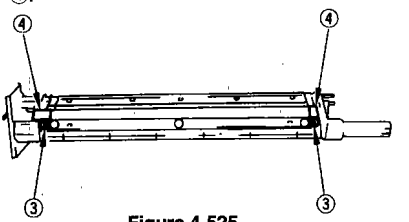


Figure 4-525


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# B. Corona Assemblies

## 1. Outline

The copier uses four corona assemblies, and corona wires of 0.06 mm in diameter are used.

The grid wire of the primary corona assembly is gold-plated and has a diameter of 0.1 mm.

## 2. Replacing the Wire Cleaning Pad of the Primary Corona Assembly

1) Remove the primary corona assembly.
2) Remove the two screws ①, and remove the shielding plate ②.

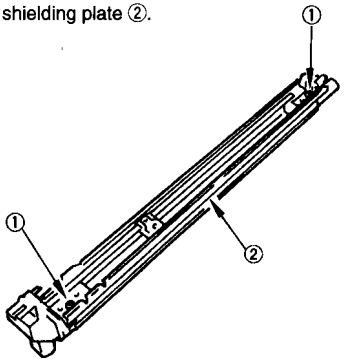


**Figure 4-526**

3) Remove the cleaning pad ③.

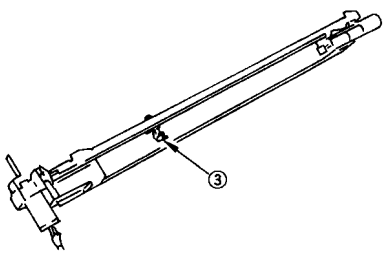


**Figure 4-527**

**Caution:**

Go through the following for cleaning and inspecting the primary corona assembly:

- Make thorough checks on the block (front, rear) for melting by leakage, deformation by heat, cracks and discoloration.
  If a fault is found, immediately replace it with a new part.
- When inspecting and cleaning the block (front, rear), be sure not to leave out the inside.
- Do NOT use a cloth carrying metal particles.
- Do NOT use a moist cloth. Instead, use lint-free paper to dry wipe it and then use alcohol. (Make sure that the part has completely dried before installing it back into the machine.)
- Make sure that the machine is serviced on a periodical basis and all periodically replaced parts are replaced on a periodical basis.

# VI. DEVELOPING SYSTEM

## A. Developing Assembly

### 1. Construction

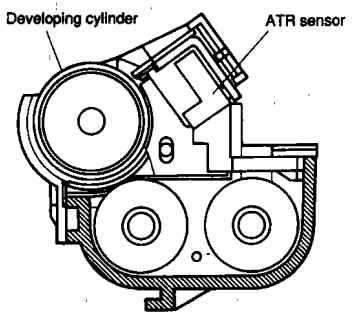


Figure 4-601

### 2. Removing the Y/M/C Developing Assembly

1) Open the front door.
2) Remove the screw, and remove the hopper stopper plate; then, full open the hopper.
3) Remove the screw ① of each of the developing assemblies, and disconnect the connector ②; then, remove the developing assembly with care.

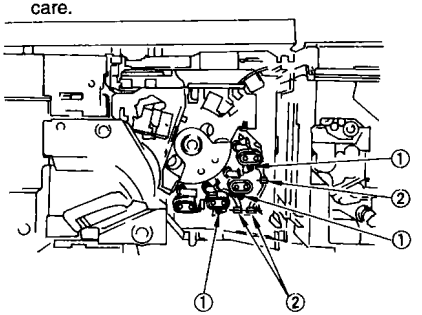


Figure 4-602

### 3. Removing the Bk Developing Assembly

1) Open the front door.
2) Remove the screw, and remove the hopper stopper plate; then, open the hopper fully.
3) Remove the screw of each of the developing assemblies, and remove the developing blade cover.

**Caution:**
If you have disconnected the connector when removing and installing the developing assembly, be sure to clean the inside of the ATR sensor connector.

### 4. Removing the ATR Sensor of the Y/M/C Developing Assembly

1) Remove the Y/M/C developing.
2) Remove the screw ①, and remove the developing blade cover ② by sliding it to the left.

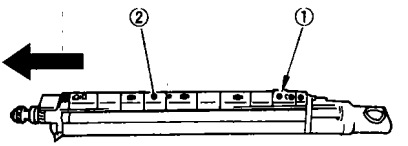


Figure 4-603

3) Remove the four screws ③, and disconnect the connector ④; then, remove the developing blade unit.

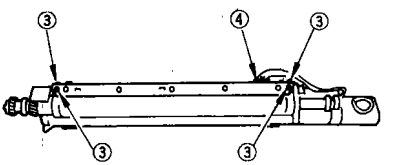


Figure 4-604

4) Remove the three screws ⑤, and remove the ATR sensor ⑥.

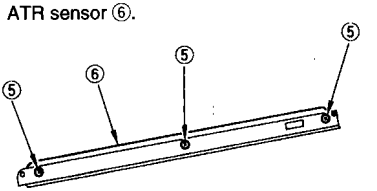


Figure 4-605


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## 5. Removing the Developing Cylinder

1) Remove the Y/M/C developing assembly.
2) Remove the screw ①, and remove the developing blade cover ②.

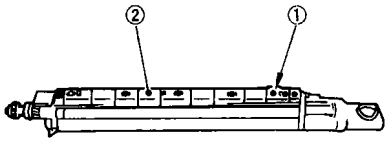



**Figure 4-606**

3) Remove the four screws ③, and disconnect the connector ④; then, remove the blade unit.

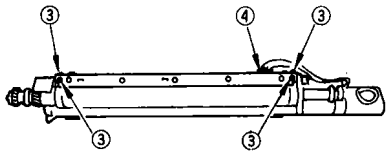
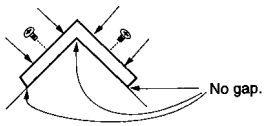



**Figure 4-607**

**Caution:**
To assemble, force the developing blade unit down as shown, and screw it in place.




4) Remove the three screws ⑤, and remove the developing assembly lower cover ⑥.

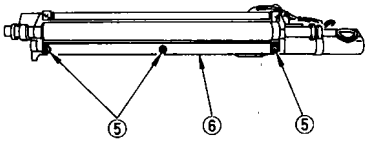



**Figure 4-608**

5) Remove the resin screw ⑦ from the front of the developing assembly, and remove the electrode plate cover ⑧.

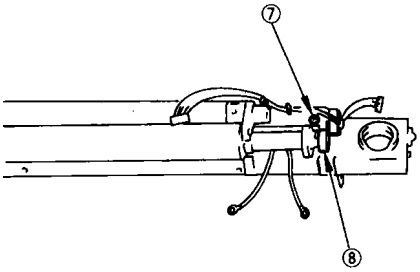



**Figure 4-609**

6) Remove the two screws ⑨, and remove the electrode ⑩ of the developing cylinder.

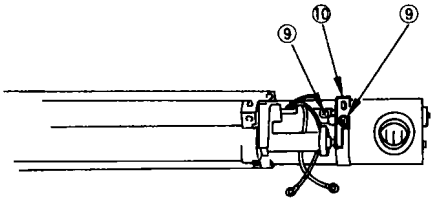



**Figure 4-610**

7) Remove the grip ring ⑪, bearing ⑫, and spacer ⑬.

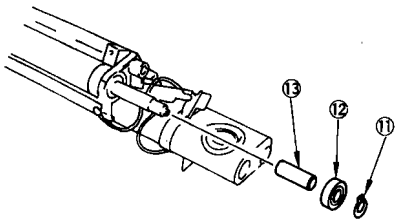



**Figure 4-611**

**Caution:**
During assembly, be sure to create a gap of 0.2±0.1 mm between the bearing ⑫ and the grip ring.

8) Remove the two E-rings ⑭, grip ring ⑮, three gears ⑯, spacer ⑰, and sleave slider ⑱ from the rear of the developing assembly.

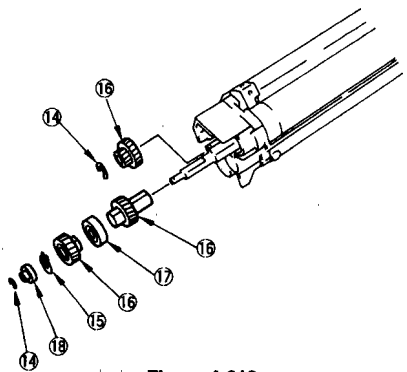



**Figure 4-612**

**Caution:**
During assembly, check to make sure that there is no gap between the gear ⑯ and the grip ring ⑮.

9) Push the bearings ⑲ on both ends of the developing cylinder toward the outside, and pull out the cylinder ⑳.

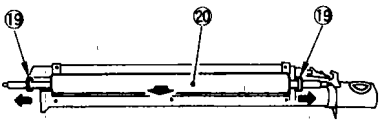



**Figure 4-613**

**Caution:**
Force the sleeve in the direction of Y while butting the bearing against the wall X1 of the case; then, install the grip ring Z. (Make sure there is no gap.)
Thereafter, butt the bearing on the opposite side against the wall X2 of the case; then, install the grip ring so that the gap between the grip ring and the roll is 0.2 ±0.1 mm.

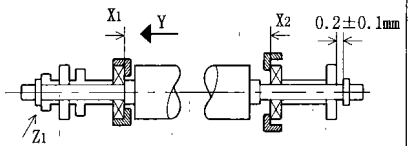



**Figure 4-614**

**Caution:**
If poor contact is noted between the developing assembly drive unit and the developing assembly high-voltage supply unit, or a development fault caused by such poor contact, replace the sleeve slider ⑱ (Figure 4-612) with a new part as shown in "XI Others" in Chapter 4.

**Caution:**
The developing cylinders are not compatible since the polarity orientation differs from one cylinder to another (color). Identify the correct developing cylinder by the color marking on the edge of its shaft.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The developing sleeve for cyan comes in two types, identified by the lot number marking found on its end. (See Figure 4-615.)

To avoid adjustment of the S-B gap at time of replacing the sleeve for cyan, use a sleeve obtained from the manufacturer that produced the one already in the developing assembly.

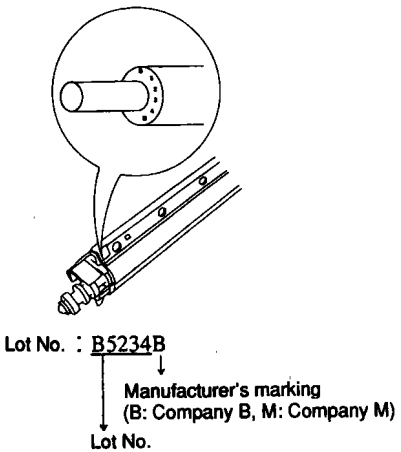


**Figure 4-615**

If you have replaced the developing blade, make adjustments using the appropriate service tool (FY9-3015); see Table 4-601 for the S-B gap of each sleeve.

| Developer color | S-B gap |
|---|---|
| Yellow | 0.70mm |
| Cyan (Company B) | 0.70mm |
| Cyan (Company M) | 0.92mm |
| Magenta | 0.70mm |
| Black | 0.90mm |

**Table 4-601**

Adjusting the S-B Gap

Put two gauges of the appropriate color (service tool FY9-3015-000) between the developing blade and the sleeve, and fix the developing blade in place.

**Figure 4-616**

**Caution:**
If the developing assembly is inserted at an angle, its gear at the rear can damage the photosensitive drum.
Be sure to insert it along the rail while holding it straight so that the gear will not come into contact with the drum.

**Caution:**
When inserting the black developing assembly, be sure that it will not override the rail.

# B. Hopper Assembly

## 1. Opening the Hopper

1) Open the front door.
2) Remove the screw ①, and remove the hopper stopper plate; then, open the hopper fully.

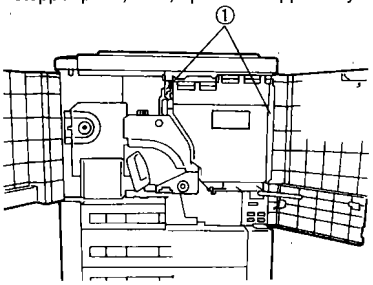


Figure 4-617

## 2. Removing the Hopper Unit

1) Open the hopper.
2) Disconnect the three connectors from the bottom of the hopper unit.

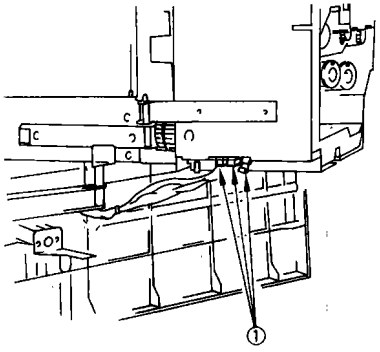


Figure 4-618

3) Hold the hopper unit as shown in Figure 4-619, and lift it.

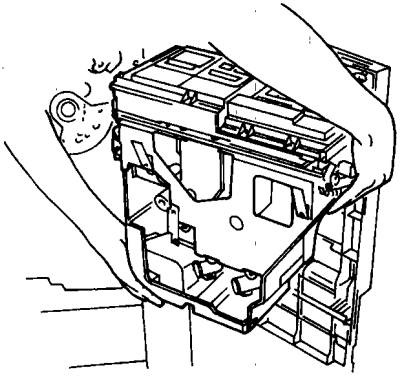

Figure 4-619

## 3. Removing the Hopper Motor

1) Remove the hopper unit.
2) Remove the two screws ①, and remove the hopper cover ②.

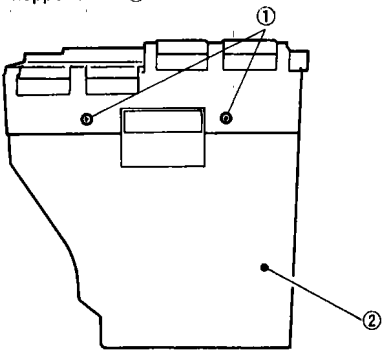


Figure 4-620


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3) Remove the grip ring ③, and remove the gear ④.

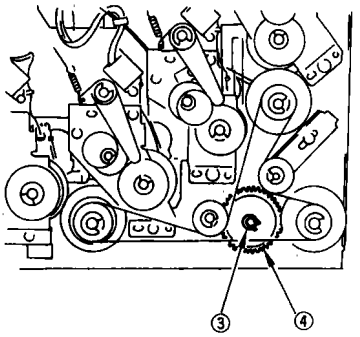


**Figure 4-621**

4) Remove the screw ⑤, and remove the toner receptacle ⑥.

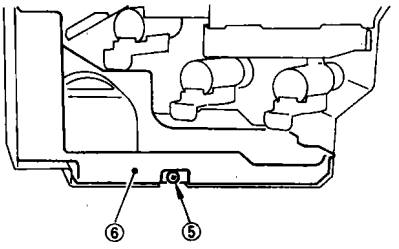


**Figure 4-622**

**Caution:**
If the hopper motor fails to turn on or off, the transistor on the DC controller PCB may be damaged.
Be sure to replace the DC controller PCB as necessary.

5) Disconnect the connector ⑦, and remove the two screws ⑧; then, remove the hopper motor ⑨.

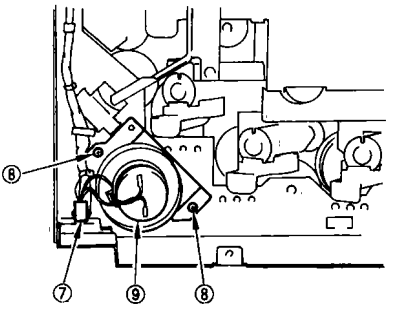


**Figure 4-623**

## 4-1. Removing the Toner Supply Clutch (TYPE 1)

1) Install the toner stopper to the toner supply mouth, and remove the hopper unit; then, remove the hopper cover.

For Black Toner

2) Remove the E-ring ① and bushing ② on the toner supply mouth side.

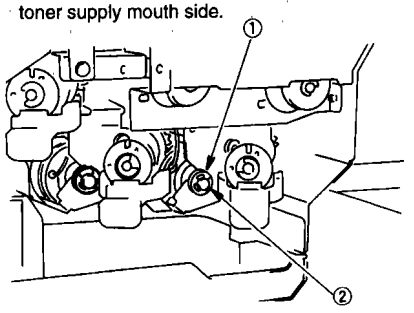


Figure 4-624

3) Remove the two E-rings ③ on the hopper drive side, and remove the lever ④ and spring ⑤.

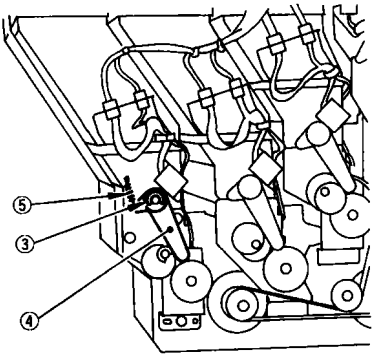


Figure 4-625

4) Disconnect the connector ⑥, and remove the E-ring ⑦ and gear ⑧ (pay attention to the parallel gear) equipped with a cam; then, remove the three screws ⑨, and remove the gear unit ⑩.

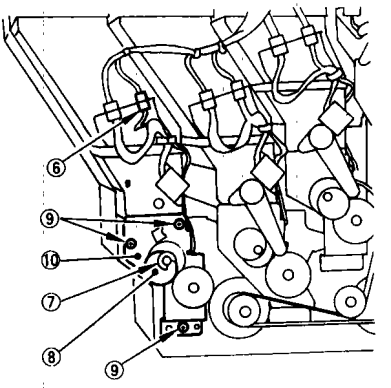


Figure 4-626

5) Remove the two E-rings ⑪, and remove the two gears ⑫; then, remove the toner supply clutch.

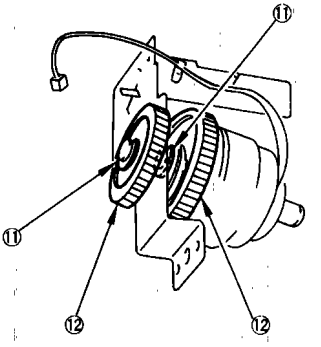


Figure 4-627


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## 4-2. Removing the Toner Supply Clutch (TYPE 2)

The discussions that follow are based on the black hopper.

1) Remove the hopper unit, and remove the hopper cover.
2) Remove the six screws ①, and remove the hopper upper cover ②.

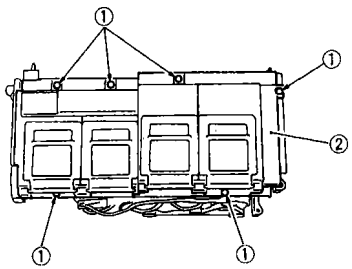


**Figure 4-628**

3) Remove the two screws ③, and remove the reinforcing plate ④.

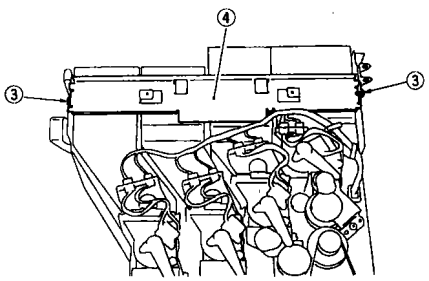


**Figure 4-629**

4) Remove the screw ⑤, and disconnect the two connectors ⑥; then, remove the black hopper.

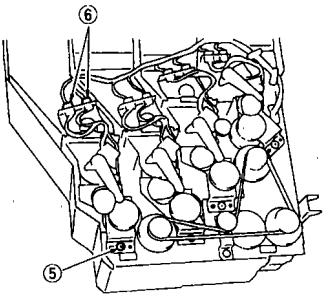


**Figure 4-630**

5) Remove the E-ring, bar, spring, E-ring, gear with a cam (pay attention to the parallel gear), two-E-rings, and two gears from the hopper drive assembly; then, remove the clutch.

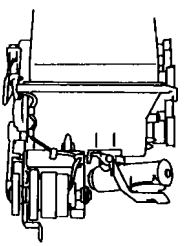

**Figure 4-631**

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# VII. FIXING SYSTEM

## A. Fixing Assembly

### 1. Detaching the Fixing Assembly

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing assembly cover.
3) Slide out the transfer assembly frame.
4) Hold the grip at the front and the pin at the rear of the fixing assembly, and lift the assembly to remove.

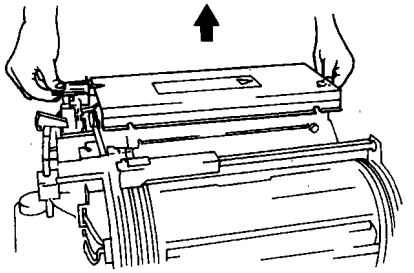

Figure 4-701

### 2. Opening the Upper Fixing Roller Unit

1) Open the front left door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Remove the two screws, and remove the upper fixing cover.
5) Open the inside delivery (fixing/delivery assembly), and remove the two screws ①; then, remove the upper fixing roller unit ②.

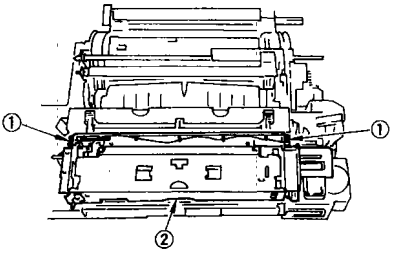


Figure 4-702

### 3. Removing the Upper Fixing Heater

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Pull out the faston ① from the rear of the upper fixing heater.

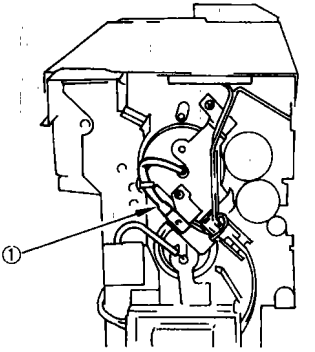


Figure 4-703


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5) Pull out the faston ② from the front of the upper fixing heater; then, remove the screw ③ and metal fixing ④.

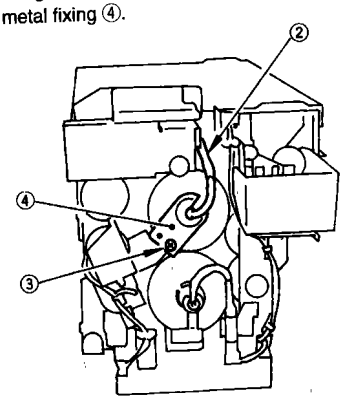


Figure 4-704

6) Pull out the upper fixing heater toward the front.

## 4. Detaching the Upper Fixing Roller

1) Open the front door.
2) Remove the transfer frame cover and fixing cover.
3) Slide out the transfer frame.
4) Remove the upper fixing heater.
5) Remove the upper fixing roller metal fixing ① (each from front and rear).

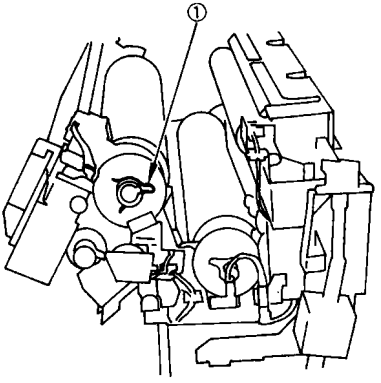


Figure 4-705

6) Move the bearing ② at the upper fixing roller, and pull out the upper fixing roller ③ as shown in Figure 4-706.

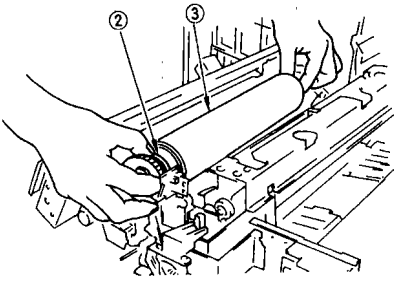


Figure 4-706

## 5. Detaching the Lower Fixing Heater

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Pull out the transfer assembly frame.
4) Pull out the faston ① at the rear of the lower fixing heater.

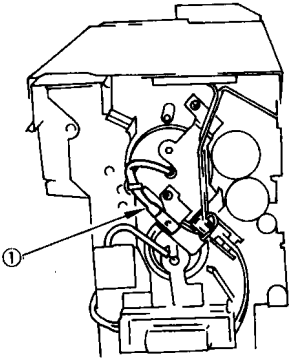


Figure 4-707

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5) Pull out the faston ② at the front of the lower fixing heater; then, remove the screw ③ and metal fixing ④.

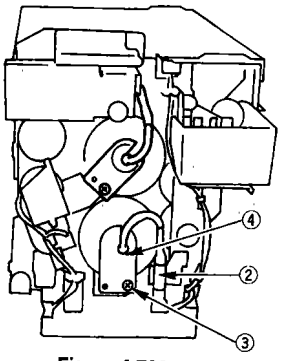


Figure 4-708

6) Pull out the lower fixing heater toward the front.

## 6. Removing the Lower Fixing Roller

1) Open the front door.
2) Remove the transfer frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Put down the fixing assembly unit.
5) Remove the screw ①, and slide the fixing assembly inlet guide ② toward the rear to remove.

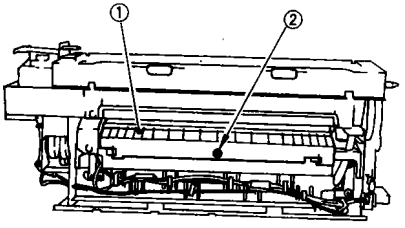


Figure 4-709

6) Remove the lower fixing heater.
7) Open the upper fixing roller unit.
8) Remove the lower fixing roller metal fixing ③ (each from front and rear).

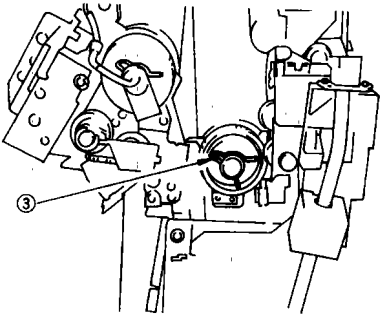


Figure 4-710

9) Remove the screw ④, and remove the lower fixing roller static eliminator brush ⑤.

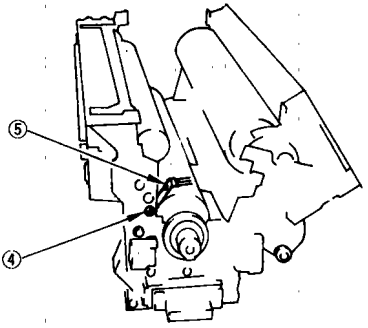


Figure 4-711


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10) Move the bearing at the rear of the lower fixing roller, and pull out the lower fixing roller as shown in Figure 4-712.

**Caution:**
When attaching the roller, take care not to damage it by hitting the thermistor.

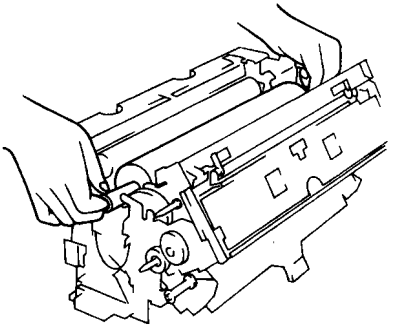

**Figure 4-712**

## 7. Identifying the Lower and Upper Fixing Rollers (front, rear)

- The end of the lower fixing roller is equipped with a collar.
- The upper fixing roller does not have a collar, but has a cut-off at the front and rear.
- The side with Teflon tape or PFA tube must be at the rear.

## 8. Removing the Fixing Assembly Thermistor (upper, lower)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Remove the screw ①, and disconnect the connector ② (front); then, remove the upper fixing assembly thermistor.

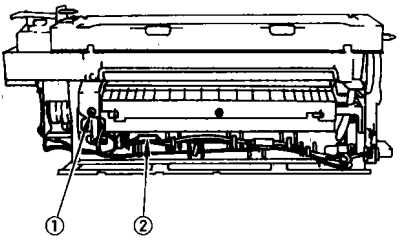


**Figure 4-713**

5) Remove the screw ③, and disconnect the connector ④ (rear); then, remove the lower fixing assembly thermistor.

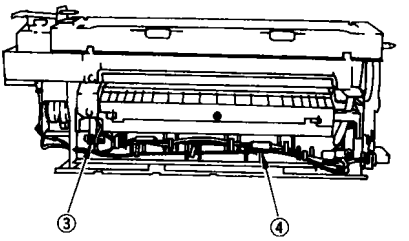


**Figure 4-714**

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## 9. Detaching the Fixing Assembly Thermal Switch (lower)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Remove the screw ①, and remove the lower fixing thermal switch ② together with its mount.

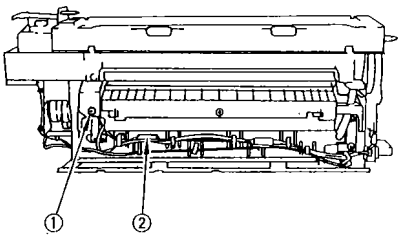


**Figure 4-715**

5) Detach the lower fixing thermal switch from the mount.

## 10. Removing the Fixing Thermal Switch (upper)

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Remove the two screws, and remove the upper fixing assembly.
4) Remove the cleaning belt unit.
5) Remove the screw, and remove the thermistor together with its mount.
6) Pull out the two fastons ①.

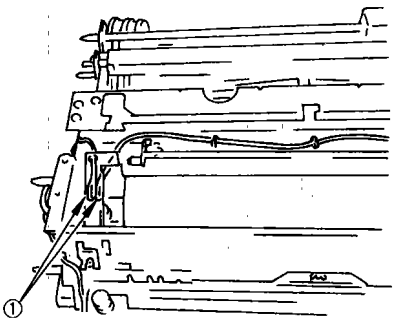


**Figure 4-716**

## 11. Adjusting the Fixing Nip

1) Execute 'NIP-CHK' of 'FUSER' under 'FUNC' in service mode.

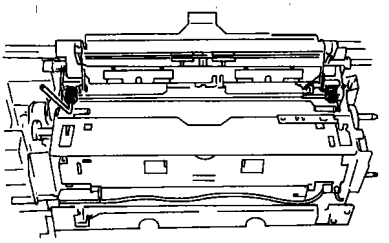

**Figure 4-717**

2) If the nip pressure is not as indicated, adjust it using the adjusting nut.


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## B. Fixing Assembly Cleaner

### 1. Detaching Cleaning Belt

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Remove the two screws, and remove the fixing assembly upper cover.
4) Remove the two cleaning belt pressure springs ①.

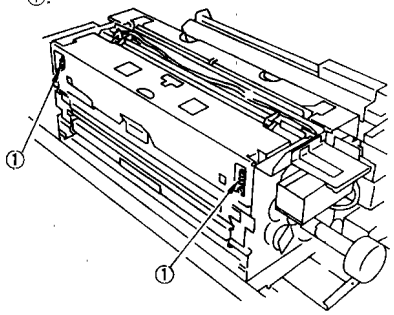



**Figure 4-718**

5) Insert a metal ruler or flat-blade screwdriver into the stop plate ② to release force to the fixing assembly cleaning belt.

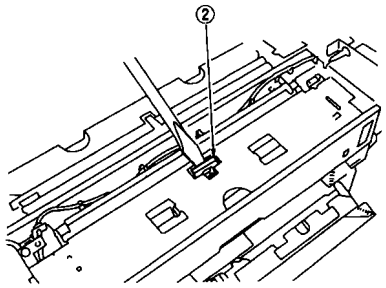



**Figure 4-719**

6) Remove the screw ③, and remove the hinge of the cleaning belt unit; then, remove the cleaning belt unit.

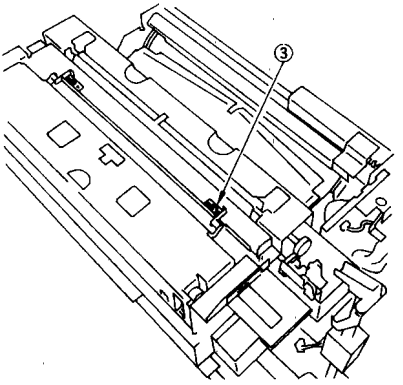



**Figure 4-720**

7) Remove the two screws ④, and remove the two bushings ⑤; then, remove the cleaning belt.

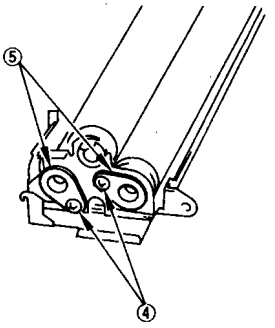



**Figure 4-721**

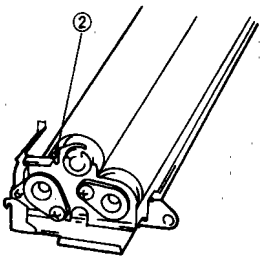
### 2. Attaching the Cleaning Belt

The service parts for the cleaning belt consist of the feeding shaft, take-up shaft, and belt integrated as a single entity.

Install the component parts as in detaching them but only in reverse; keep the following in mind.

1) Wind the belt two to three times around the take-up shaft.
2) After attaching the belt, put the detecting portion ② of the length detecting lever ① in the belt; then, remove the slack.

**Caution:**
The cleaning belt can become slack if the upper roller unit has been opened and is closed after maintenance.
Operate the cleaning belt drive unit 10 to 20 times by hand after finishing maintenance work to remove the slack.



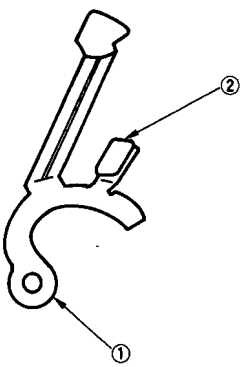




Figure 4-722

## C. Fixing Oil Applying Assembly/Removing Assembly

### 1. Detaching the Oil Applying Roller Unit

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing assembly cover.
3) Slide out the transfer assembly frame.
4) Remove the fixing assembly upper cover, and open the upper fixing roller unit.
5) Remove the four screws ①, and remove the oil applying roller unit ②.

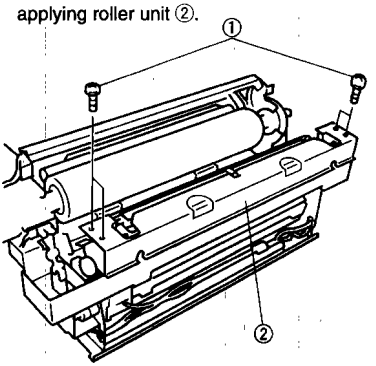



Figure 4-723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## 2. Detaching the Oil Applying Roller Blade

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Open the upper fixing roller unit.
5) Fully open the oil applying roller blade unit ①, and pull it out.

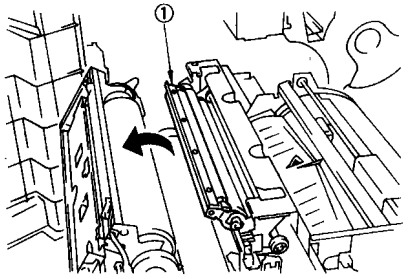


**Figure 4-724**

6) Remove the four screws ②, and remove the oil applying roller blade.

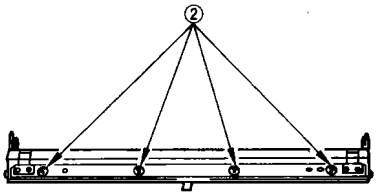


**Figure 4-725**

## 3. Detaching the Oil Applying Roller

1) Open the front door.
2) Remove the transfer assembly frame cover and fixing cover.
3) Slide out the transfer assembly frame.
4) Remove the upper fixing assembly cover.
5) Open the upper fixing roller unit.
6) Remove the oil applying roller blade.
7) Remove the two E-rings ① (one each from front and rear), remove the two bushings ② (one each from front and rear), and remove the gear ③ from the rear. (Take care not to let the parallel pin ④ slip off the gear.)

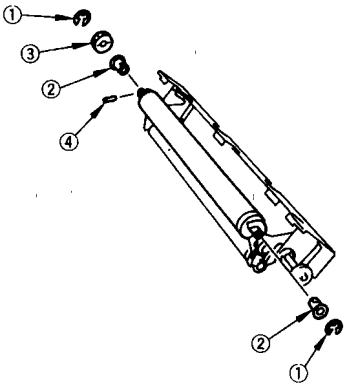


**Figure 4-726**

### 4. Detaching the Oil Removing Blade

1) Open the front left door.
2) Slide out the transfer assembly frame.
3) Put down the fixing assembly unit.
4) Open the upper fixing roller unit.
5) Remove the two screws ①, and pull out the oil removing blade ②.

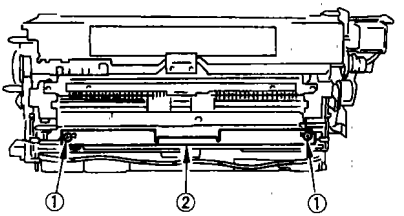


**Figure 4-727**

**Caution:**
Install the oil removing blade so that the ID marking (white, indelible ink) is toward the blade mount.
Otherwise, it may not properly remove oil or can wear out the lower fixing roller fast.

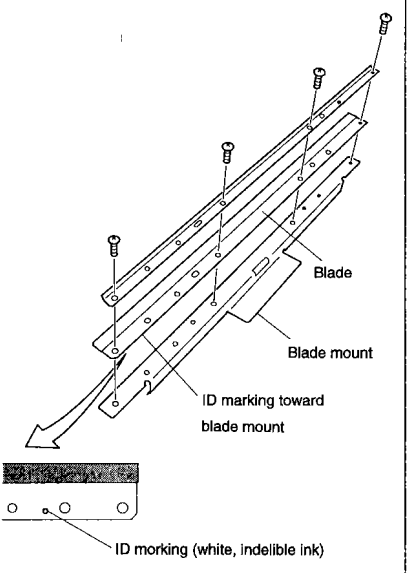


**Figure 4-728**

## D. Internal Delivery Assembly

### 1. Detaching the Fixing Assembly Separation Claw

1) Open the front door.
2) Remove the fixing cover.
3) Remove the two screws ①, and remove the separation claw metal fixing ②.
4) Remove the four fixing separation claws.

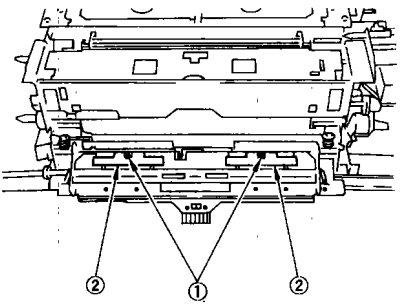


**Figure 4-729**

**Caution:**
Be sure to replace the claw spring at the same time.


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# VIII. DUPLEXING UNIT

## A. Pick-Up Assembly

### 1. Removing the Pick-Up Roller

1) Remove the duplexing unit pick-up assembly.
2) Remove the E-ring ① (made of resin), and pull out the pick-up roller ② together with its collar.

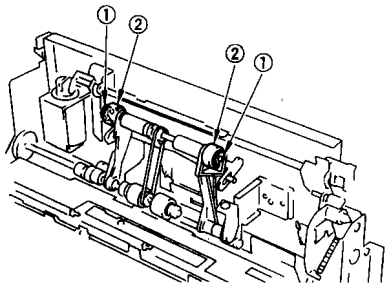


**Figure 4-801**

**Caution:**

a. When attaching the pick-up roller ① to the pick-up assembly, make sure that the side with a round marking ② on the rubber portion is toward the copier's front.

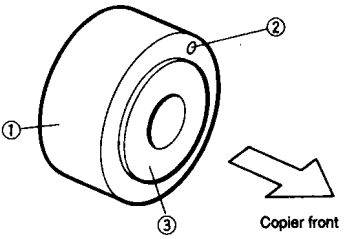


**Figure 4-802**

The pick-up rollers are identified by color ③ as follows:
brass for the front
silver for the rear
Make sure the correct rollers are used.

b. Do not remove the rubber portion of the pick-up roller from the collar.

## 2. Removing the Feeding Roller 1

1) Remove the duplexing unit pick-up assembly.
2) Remove the screw ①, and remove the pick-up roller arm bushing ②.
3) Remove the E-ring ③ (made of resin).

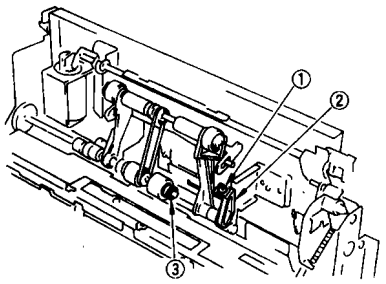


Figure 4-803

4) Pull out the feeding roller ⑤ together with the belt ④.

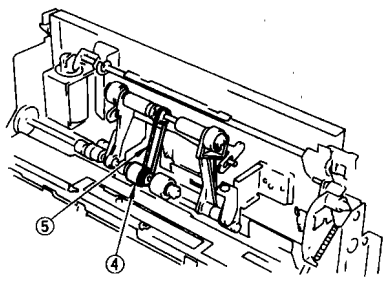


Figure 4-804

**Caution:**

When attaching the feeding roller ① to the pick-up assembly, make sure that the gear ② installed to the feeding roller is toward the copier's rear.

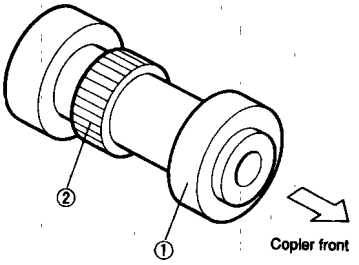


Figure 4-805

## 3. Detaching the Feeding Roller 2

1) Remove the duplexing unit pick-up assembly.
2) Remove the two screws ①, and remove the duplexing unit pick-up assembly internal guide ②.

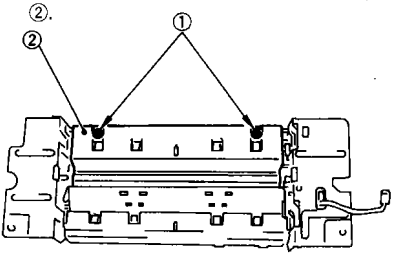


Figure 4-806


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3) Remove the two E-rings ③ (made of resin).

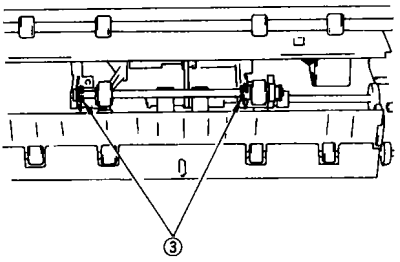


**Figure 4-807**

4) Shift the two feeding roller 2 bushings ④ toward the inside, and remove them together with the shaft ⑤.

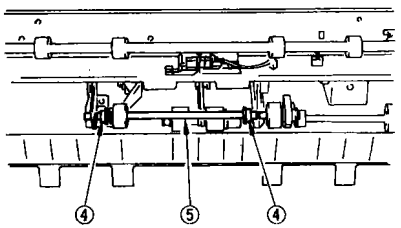


**Figure 4-808**

5) Remove the two E-rings ⑥ (made of resin) and gear ⑦; then, remove the feeding roller 2 from the shaft.

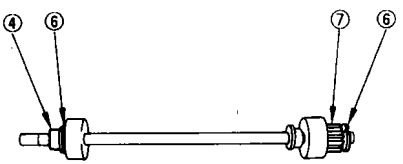


**Figure 4-809**

**Caution:**
The gear ⑦ is fixed to the feeding roller 2 shaft with a parallel pin; take care not to drop the pin when detaching and attaching the gear.

## 4. Detaching the Separation Roller

1) Remove the duplexing unit pick-up assembly.
2) Remove the screw ②, and remove the separation roller cover ①.

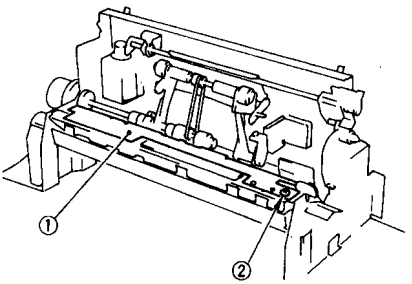


**Figure 4-810**

3) Remove the screw ④, and remove the separation roller unit ③.

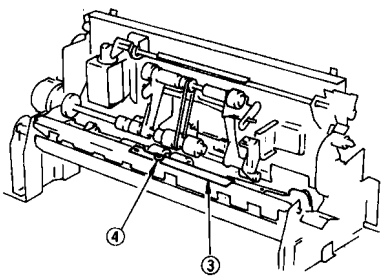


**Figure 4-811**

4) Remove the two E-rings ⑤ (made of resin).
5) Pull out the separation roller shaft ⑥, and remove the separation roller ⑦.

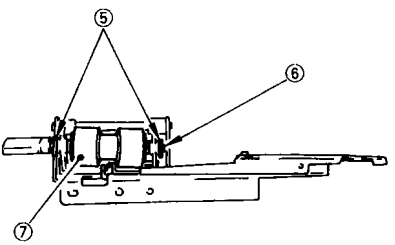


**Figure 4-812**

**Caution:**
When attaching the separation roller ① to the pick-up assembly, make sure that the D-shaped cut-out is toward the front.

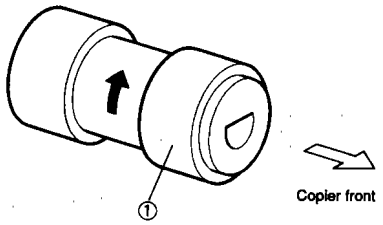


Figure 4-813

### 5. Positioning the Pick-Up Roller Releasing Solenoid (SL21)

1) Remove the duplexing unit pick-up assembly.
2) Place the duplexing unit pick-up assembly as shown in Figure 4-814, and hold the lever ① so that the pick-up roller ② drops on its own.
3) Adjust the pick-up roller releasing solenoid (SL21) so that the length L is 65 ±1 mm.

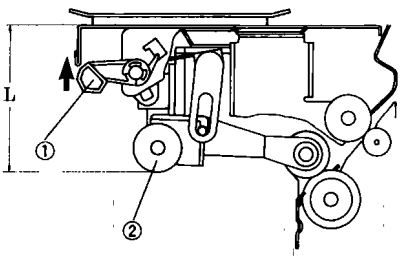


Figure 4-814

## B. Feeding Assembly

### 1. Removing the Duplexing Unit

1) Slide out the cassettes 3 and 4.
2) Remove the lower right cover.
3) Open the pick-up door and duplexing reversing assembly door.
4) Remove the two screws ①, and remove the two stopper plates ②.

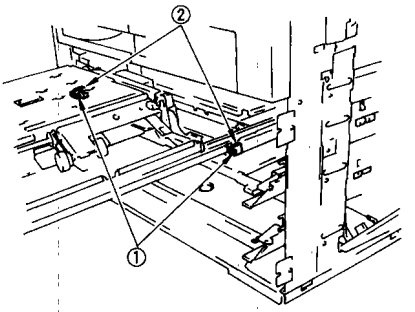


Figure 4-815

5) Slide out the duplexing unit.

### 2. Removing the Feeding Roller

1) Remove the duplexing unit.
2) Remove the two grip rings ①, and remove the feeding roller ③ from the roller shaft ②.

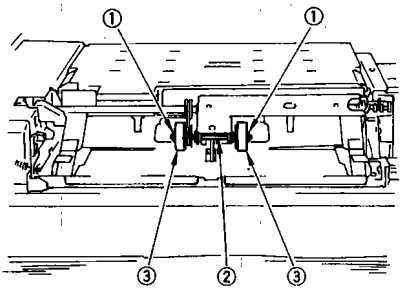


Figure 4-816


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### 3. Removing the Curl Pressing Sheet

1) Remove the duplexing unit.
2) While lifting the duplexing feeding assembly ①, remove the six screws ②, and remove the six curl pressing sheets ③.

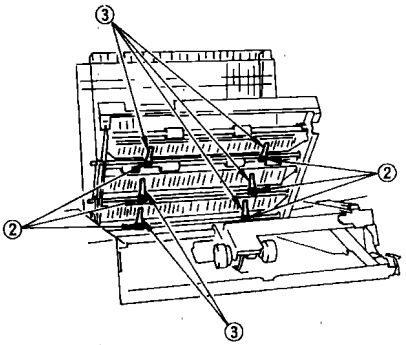


**Figure 4-817**

3) Remove the two screws ④, and remove the remaining two curl pressing sheets ⑤.

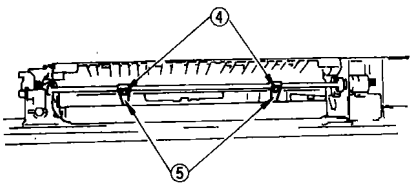


**Figure 4-818**

**Caution:**
Do not touch the portion where the gear (pulley) fixed to the shaft of the decurling sheet and the belt engage with each other; the parts are engaged with high accuracy.

### 4. Detaching the Duplexing Stacking Assembly Heater

1) Remove the duplexing unit.
2) Remove the four screws ①, and remove the front cover ②.

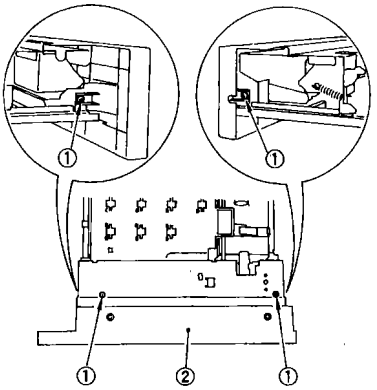


**Figure 4-819**

3) Remove the screw ③, and remove the spring ④; then, remove the grip ⑤.

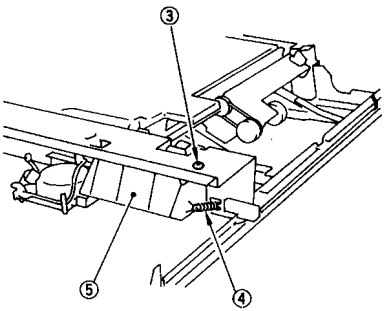


**Figure 4-820**

4) Remove the E-ring ⑥, and remove the bushing ⑦.

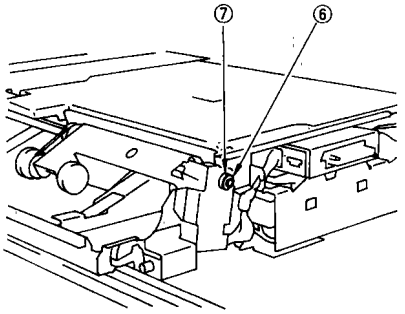


**Figure 4-821**

5) Remove the feeding roller drive belt ⑧ from the gear, and pull out the feeding roller shaft ⑨ from the front.

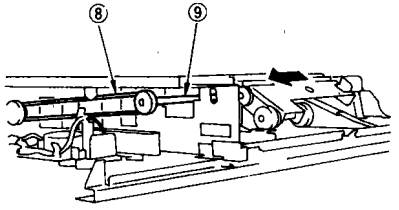


**Figure 4-822**

6) Remove the two screws ⑩ used to hold the paper jogging guide in place.

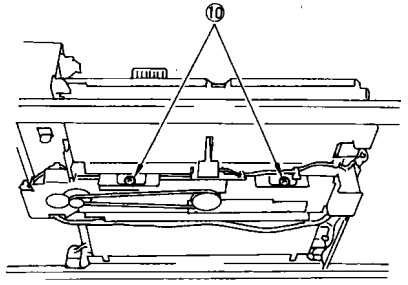


**Figure 4-823**

7) Remove the four screws ⑫ used to hold the heater base plate ⑪.

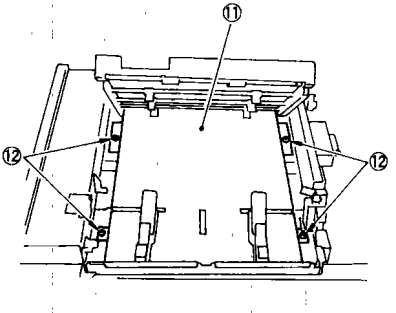


**Figure 4-824**

8) Hold up the edge of the heater base plate ⑬, and pull out the mount together with the two paper jogging guides ⑭ in the direction of the arrow.

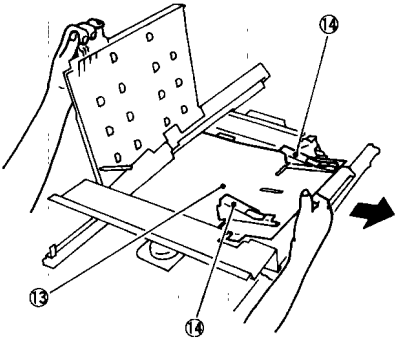


**Figure 4-825**


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# IX. ELECTRICAL SYSTEM

## 1. Replacing the DC Controller PCB

Execute 'BACK UP' in service mode before replacing the PCB.

1) Remove the rear over.
2) Remove the eight screws, disconnect the connector.
3) After replacing the DC controller PCB, go through the following:

- Replace the developer (all four colors), and execute 'STIR-4' and 'INIT-4' under 'FUNC → INSTALL'.
  Record the results on the service label (those indicated by * in Figure 4-901). However, for 'SGNL-K', enter a value obtained by adding '37' to the result.
- Enter the values recorded on the service value (only those not indicated by * in Figure 4-901) in 'FUNC → D-CON'. However, for 'SGNL-K', add a value obtained by adding '37' once again.
- When you have entered all values for each screen, press 'SEND'.
- Set 'PASCAL' of 'ADJUST → PASCAL' to '1'.
- When you have finished entering all values, turn off and then on the power switch.

| | | TYP | | | |
|---|---|---|---|---|---|
| | B5-C1 | | | | |
| | A4-C1 | | | | |
| | STMTR-C2 | | | | |
| | A4R-C2 | | | | |
| | STMTR-C3 | | | | |
| | A4R-C3 | | | | |
| | STMTR-C4 | | | | |
| | A4R-C4 | | | | |
| | A6R-MF | | | | |
| | A4R-MF | | | | |
| | A4-MF | | | | |
| * | SGNL-M | | | | |
| * | SGNL-C | | | | |
| * | SGNL-Y | | | | |
| * | SGNL-K | | | | |
| * | SGNL-D | | | | |
| * | REF-M | | | | |
| * | REF-C | | | | |
| * | REF-Y | | | | |
| * | REF-K | | | | |
| * | REF-D | | | | |
| * | SGAIN-M | | | | |
| * | SGAIN-C | | | | |
| * | SGAIN-Y | | | | |
| * | SGAIN-K | | | | |
| * | RGAIN-K | | | | |
| | PT-OFST | | | | |
| | EPOT-OFST | | | | |
| | ATT-T-A | | | | |
| | ATT-T-B | | | | |
| | RG-XA | | | | |
| | RG-XB | | | | |
| | RG-Y | | | | |
| | TR-DELAY | | | | |
| | TR-FAST | | | | |
| | | | | | |
| | | | | | |
| | BODY-NO | | | | |

FS5-8837

**Figure 4-901**

## 2. Detaching the Image Processor PCB (IP-MAIN/IP-ED/IP-IF/IP-ECO)

1) Remove the upper delivery assembly cover.
2) Remove the two screws ①, and remove the image processor PCB cover.

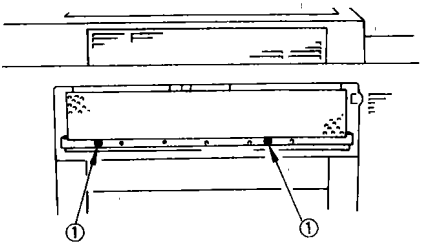


**Figure 4-902**

3) (Only if the IP-ED or IP-IF PCB installed; skip the step if you are detaching the IP-ECO.) Remove the two screws ②, and remove the interface harness retainer.

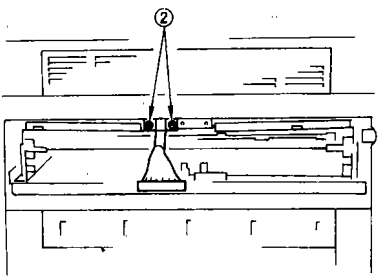


**Figure 4-903**

4) Remove the two screws from both ends of the PCB you are removing; then, shift up the levers on both ends, and pull out the image processor PCB.

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## 3. Replacing the Analog Processor PCB

1) Remove the copyboard glass, and remove the lens mount cover.
2) Remove the laser scanner cover.
3) Remove the two screws ①, and remove the IP upper cover ②; then, disconnect the connector ③, from the IP motherboard.

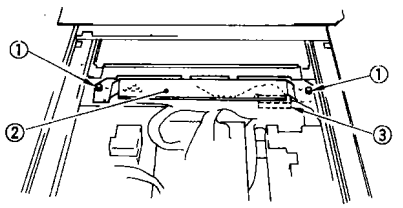


**Figure 4-904**

4) Remove the harness cover ④, remove the two screws ⑤, and disconnect the three connectors ⑥ (J2501, J2503, J2504); then, remove the analog processor PCB ⑦.

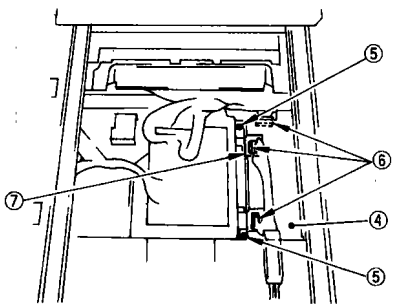


**Figure 4-905**

**Caution:**
Take care not to trap the flat cable of the image processor PCB between the base plate and the analog processor PCB.

## 4. Replacing the Reader Controller PCB

1) Remove the reader controller PCB cover and upper right cover.
2) Remove the three screws ①, and remove the reader controller cooling fan stay ②.

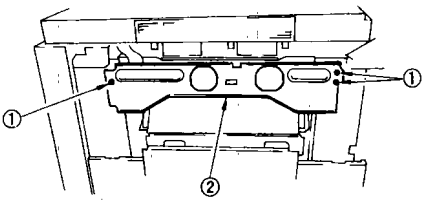


**Figure 4-906**

3) Disconnect the seven connectors ③, and remove the six screws ④; then, remove the reader controller PCB ⑤.

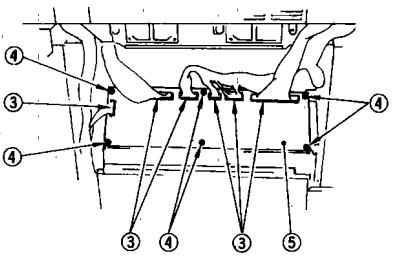


**Figure 4-907**


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4) After replacing the reader controller PCB, go through the following:

- Enter the values recorded in the service label (indicated by * in Figure 4-908) by executing 'R-CON' under 'FUNC' in service mode.
- Execute AUTO-ADJ' of 'CCD' under 'FUNC'; record the results (indicated by * in Figure 4-908) on the service label.
- If a projector is installed, execute 'FUNC → PRJ-ADJ → PRJ-CCD' in service mode.
- When you have finished entering all values, turn off and then on the power switch.

| | TYP | | |
|---|---|---|---|
| CVR-TYPE | | | |
| ADJ-X | | | |
| ADJ-Y | | | |
| ADJ-S | | | |
| ED-ADJ-X | | | |
| ED-ADJ-Y | | | |
| ADJ-J | | | |
| EC-GLASS | | | |
| DA-XS | | | |
| DA-XE | | | |
| DA-YS | | | |
| DA-YE | | | |
| DS-DOC | | | |
| DS-PRJ | | | |
| DS-OHP | | | |
| ADJ-M | | | |
| ADJ-C | | | |
| ADJ-Y | | | |
| ADJ-K | | | |

| | | TYP | | |
|---|---|---|---|---|
| OFST-M | | | | |
| OFST-C | | | | |
| OFST-Y | | | | |
| OFST-K | | | | |
| SEG-ADJ | | | | |
| BC-ADJ | | | | |
| LGCR-IPU | | | | |
| * | LAMP-DT | | | |
| * | GAIN-B | | | |
| * | GAIN-G | | | |
| * | GAIN-R | | | |
| * | TARGET-B | | | |
| * | TARGET-G | | | |
| * | TARGET-R | | | |

**Figure 4-908**

## 5. Detaching the HVT PCB

1) Remove the rear cover.
2) Disconnect the seven high-voltage connectors ① from the HVT PCB.
3) Disconnect the three connectors ② (J1, J2, J3).
4) Disconnect the connector, and remove the three screws ③; then, remove the HVT PCB ④.

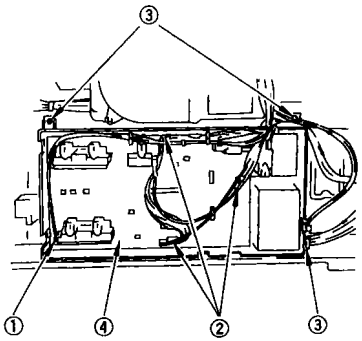


**Figure 4-909**

## 6. Detaching the Developing Bias PCB

1) Remove the rear cover.
2) Remove the HVT PCB.
3) Disconnect the two connectors ①, and remove the two screws ②; then, remove the developing bias PCB together with the PCB case.

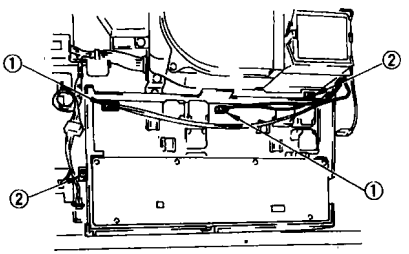


**Figure 4-910**

## 7. Detaching the Scanner Motor Driver PCB

1) Remove the copyboard glass and the lens mount cover.
2) Remove the laser scanner cover.
3) Disconnect the three connectors ① (J01, J02, J03), and remove the two screws ②; then, remove the scanner motor driver PCB ③.

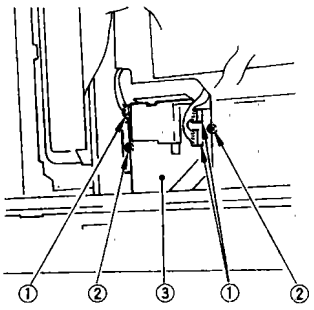


Figure 4-911

## 8. Detaching the Laser Scanner Motor Controller PCB

1) Disconnect the power plug.
2) Remove the copyboard glass and the lens mount cover.
3) Remove the four screws ①, and remove the laser scanner cover ②.
4) Remove the scanner motor driver.

**Caution:**
Move the mirror mount fully to the left. Moreover, take care not to damage the power line ③ of the scanning lamp.

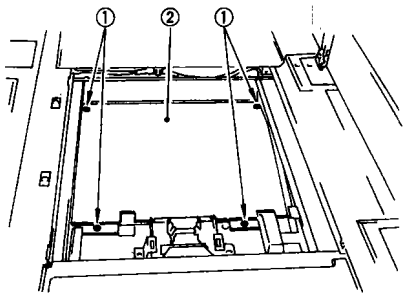


Figure 4-912

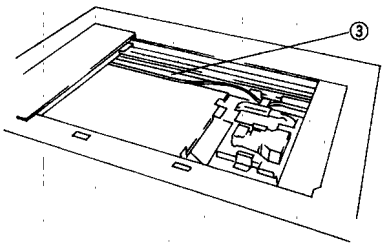


Figure 4-913

Cut-out at the Front

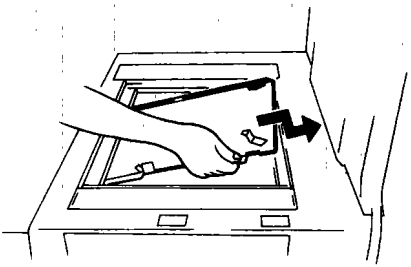

Figure 4-914


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5) Disconnect the six connectors ③, and remove the nine screws ④; then, remove the laser scanner motor unit ⑤.

**Caution:**
The laser scanner motor driver PCB is located under the scanner rail (front). Work with care noting the presence of the PCB and the harness found on the left of the laser scanner motor unit.

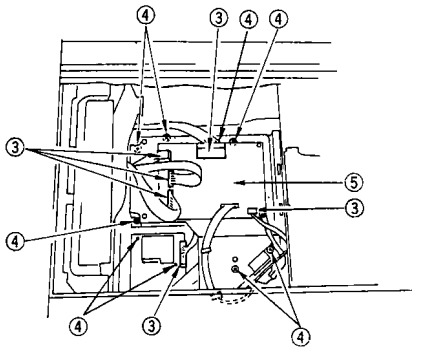

**Figure 4-915**

6) Open the harness retainer, disconnect the connectors ⑥ (J951, J952) on the laser driver PCB, and remove the four binding screws ⑦; then, remove the laser scanner motor controller PCB.

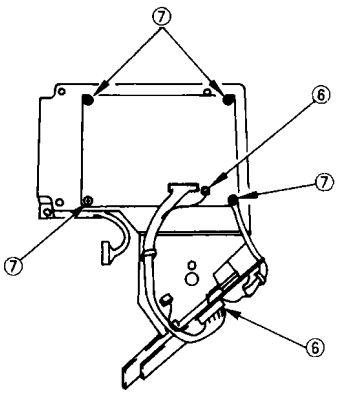

**Figure 4-916**

**Caution:**
When replacing the laser scanner unit, hold it on its metal plates and mold members, while *avoiding contact with the laser scanner controller PCB, laser scanner drive PCB, and the lens assembly.* In addition, when replacing the laser scanner controller PCB, do NOT touch any of its elements.

## 9. Detaching the Main Motor Driver PCB

1) Remove the rear cover.
2) Remove the four screws ①, and disconnect the four connectors ②; then, remove the main motor driver PCB ③.

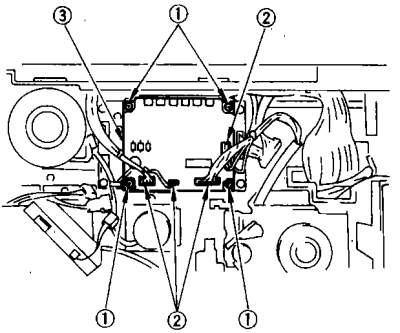

**Figure 4-917**

## 10. Detaching the Scanner Motor Driver PCB

1) Remove the main motor driver PCB, and remove the rear cover.
2) Remove the main motor driver PCB, remove the four screws ①, and disconnect the three connectors ②; then, remove the scanner motor driver PCB ③.

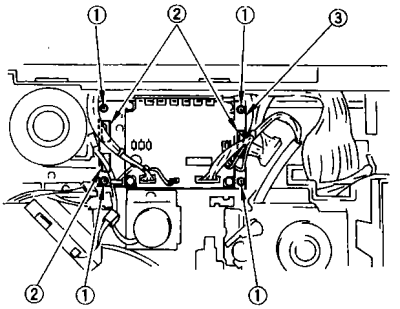

**Figure 4-918**

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# X. EDITOR

## 1. Removing the Editor Controller PCB

1) Remove the six face stickers ① used to hide screws.

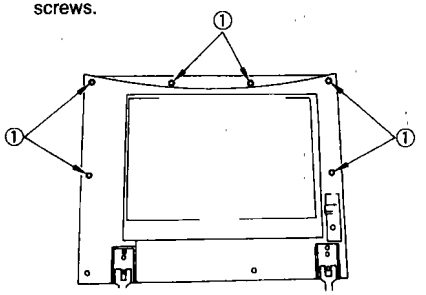


**Figure 4-1001**

2) Remove the two M8x8 screws, six M8x10 screws, and six M8x23 screws, 14 in total; then, remove the copyboard cover.
3) Remove the two screws ②, and remove the controller PCB cover ③.

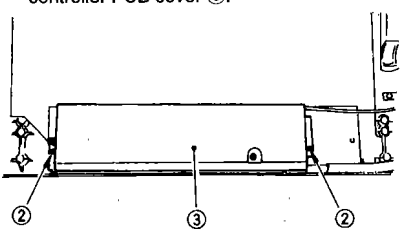


**Figure 4-1002**

4) Disconnect the two connectors ④, and remove the four screws ⑤; then, remove the flat cable ⑥, and remove the editor controller PCB ⑦.

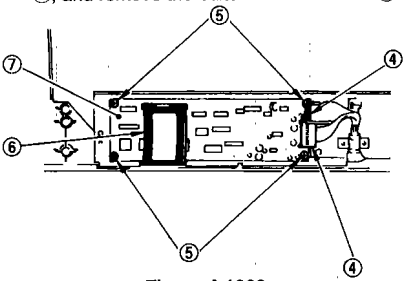


**Figure 4-1003**

**Caution:**
When attaching the controller PCB, make sure switches ① and ② are correctly positioned by referring to the settings noted on the cable.

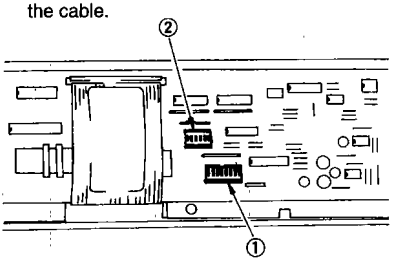


**Figure 4-1004**


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## 2. Detaching the Editor Mirror

1) Remove the six stickers used to hide screws.
2) Remove the two M8x8 screws, six M8x10 screws, and six M8x23 screws, 14 in total; then, remove the copyboard cover.
3) Remove the two screws, and remove the controller PCB cover.
4) Remove the flat cable ①, and remove the five screws ②; then, remove the controller PCB support plate ③.
5) Remove the mirror plate ④.

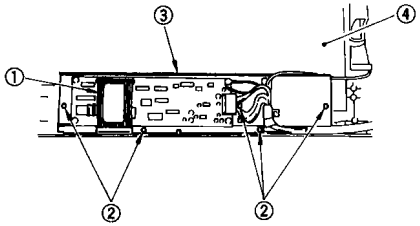


**Figure 4-1005**

# XI. OTHERS

## A. Developing Drive Assembly/Developing Assembly

Go through the steps shown below if poor contact, or development faults caused by such contact, is noted between the developing assembly drive unit and the high-voltage supply unit.

If the parts indicated are old types, replace them with new types.

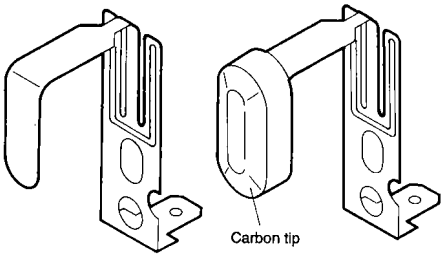


**Figure 4-1101 Developing Drive Unit Electrode**

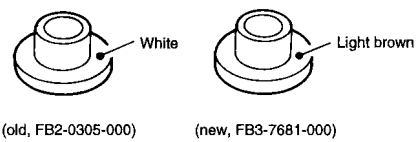


**Figure 4-1102 Developing sleeve Slider**

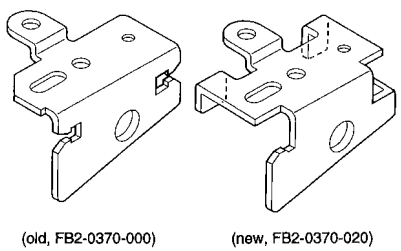


**Figure 4-1103 Developing Assembly Fixing Plate**

### 1. Replacing the Developing Drive Unit Electrode

Before starting the following work, be sure to disconnect the power plug.

1) Remove the developing assembly drive unit from the copier.
2) Remove one screw each, and remove the developing drive unit electrode.

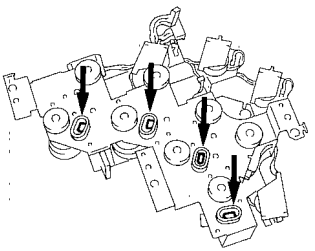

**Figure 4-1104**

3) Remove the conducting grease sticking to the inner side of the connector housing with a cotton wad moistened with alcohol.

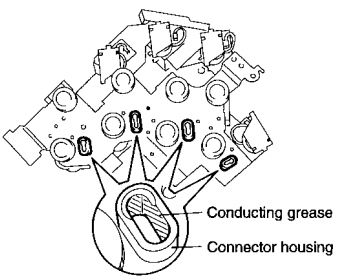


**Figure 4-1105**

4) Install the new electrode to the developing drive unit.
5) Install the developing drive unit to the copier, and assemble all the parts you have removed.


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## 2. Replacing the Sleeve Slider

Before starting the following work, be sure to disconnect the power plug.

1) Open the front door and open the hopper unit.
2) Remove the screw, and remove the developing assembly.
3) If conducting grease is found at the rear of the developing sleeve, remove it with a cotton wad moistened with alcohol.

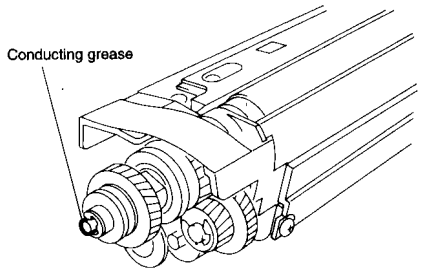



**Figure 4-1106**

4) Remove the E-ring, and replace the sleeve slider at the rear of the developing sleeve.

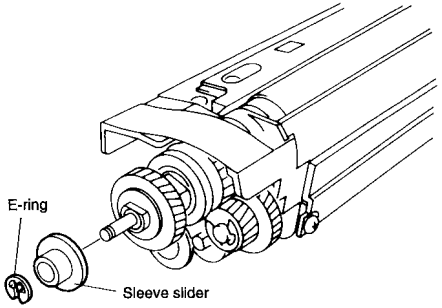


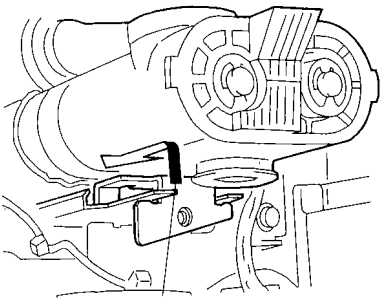

**Figure 4-1107**

5) Install the developing assembly.

## 3. Inserting the Developing Assembly (revised steps)

The shape of the developing assembly fixing plate (Figure 4-1103) has been changed to prevent improper installation.

In the new fool-proof method, the developing assembly is now forced to stop once and then inserted farther to the rear.



Lift the developing assembly, and slide it to the rear.

**Figure 4-1108**

## B. Photosensitive Drum Cleaner Paper Sensor

1. If the photosensitive drum cleaner paper sensor unit is inserted into the machine while twisting it to the right, the mold on the sensor can damage the photosensitive drum.
   The new part is made available to prevent such damage.

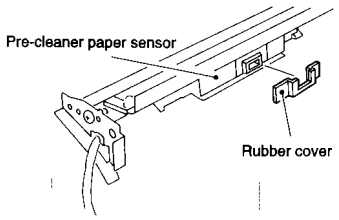



**Figure 4-1109**

2. If the photosensitive drum cleaner paper sensor unit is inserted into the machine at an angle, the edge of the metal plate can damage the photosensitive drum.
   The edge portion has been modified as shown in Figure 4-1110 to prevent such damage.

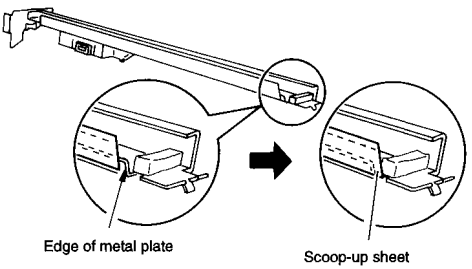



**Figure 4-1110**

## C. Scanner Assembly

### 1. Removing the Laser Assembly

1) Remove the laser scanner assembly.
2) As shown, remove the laser assembly from the laser scanner unit (3 screws, 2 connectors, 1 locking support)

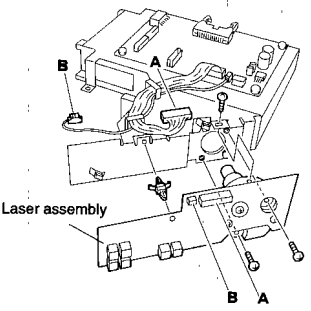



**Figure 4-1111**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**Caution:**
When handling the laser assembly, hold it as shown and avoid touching the elements on the driver PCB.
In particular, do not touch the foot of the laser; otherwise, the laser can be permanently damaged by static electricity.

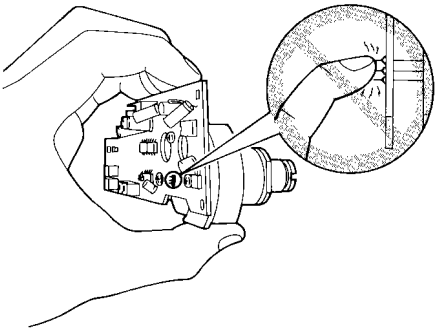

**Figure 4-1112**

## D. Transfer Drum Unit

If the transfer drum separation claw becomes soiled with toner, the images on copies or the back of copies (center in feeding direction) can become soilde.

If such a problem is noted, or when replacing the transfer sheet, add a guide plate to the transfer sheet push-up solenoid to change the stroke of the solenoid.

1) Remove the transfer drum from the copier.
2) Peel off the transfer sheet from the trasfer drum.
3) With the separation claw plate (upper) kept down, remove the two screws, and remove the transfer push-up solenoid.

**Caution:**
At this time, the screwdriver will not be perpendicular to the screw head; be sure to turn it carefully. (You need not remove the harness of the solenoid.

4) Remove the tension spring, and remove the plunger (core) of the solenoid.

5) After removing the plunger, install the solenoid to the trasfer drum.
6) Install the new spring so that its side with the smaller hook diameter is toward the push-up lever.

**Caution:**
Take care not to deform the hook portion of the tension spring when removing and installing it.

7) With the pin fitted inside the plunger in the hole of the guide plate, put the plunger into the solenoid. (At this time, the plunger is oriented 180° opposite its initial orientation.)
8) Fix the guide plate to the solenoid with two screws (M3x4).
9) Hook the tension spring on the pin position of the plunger.
10) Attach the transfer sheet to the transfer drum, and put the transfer drum back in the copier.

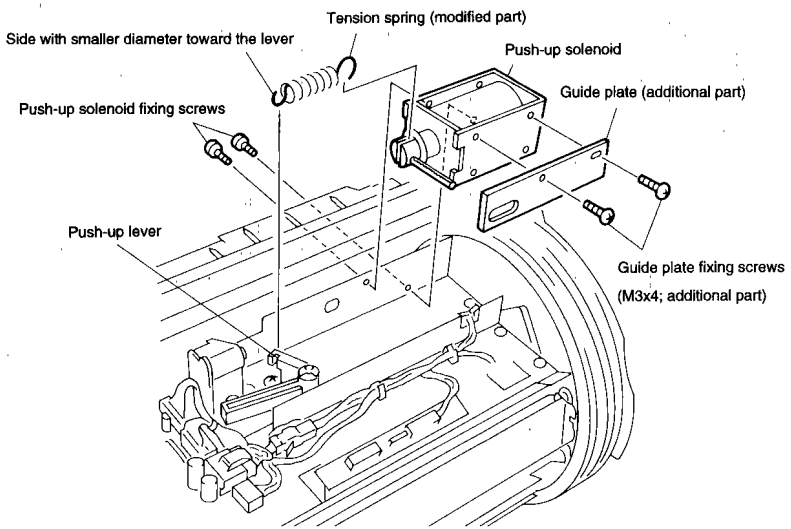


**Figure 4-1113**

**Caution:**
A serial number of each transfer drum unit is indicated on the white label attached to the rear of the transfer drum in 6 digits; the measures being discussed have already been implemented in drum units with No. 227502 or later.


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# E. Removing /Replacing the Spring Clutch

**Caution:**
Some spring clutches are paint-locked. Remove the glue before starting the work.

## 1. Duplexing Unit Spring Clutch

1) Open the lower door on the left and the right, and slide out the duplexing unit.
2) Loosen the hex screw with a hex key, and remove the spring clutch.

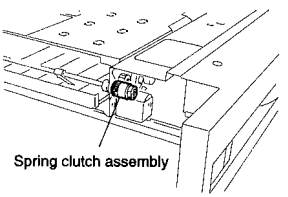


**Figure 4-1114**

3) Clean the shaft on which the spring clutch assembly was found with alcohol.
4) Loosen the hex screw on the new spring clutch.
5) Fit the shaft and the D-cut of the spring clutch boss, and engage the new spring clutch assembly and the shaft.
6) Put a transparency cut to an appropriate width between the spring clutch and the E-ring, and tighten the hex screw while butting the spring clutch against the E-ring.

## 2. Registration Roller Releasing Spring Clutch

1) Remove the fixing assembly from the transfer frame, and remove the transfer frame from the copier.
2) Remove the solenoid plate (1 tension spring), and loosen the hex screw with a hex key, and remove the spring clutch.

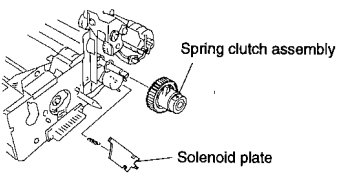


**Figure 4-1115**

3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw on the new spring clutch.
5) Install the new spring clutch to the shaft. At this time, put two transparencies cut to an appropriate width between the spring clutch assembly and the E-ring, and install the spring clutch while butting it against the E-ring. When tightening the hex screw, be sure that the D-cut of the screw and the shaft are perpendicular.

**Caution:**
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch.

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## 3. Attraction Push-On Unit Spring Clutch

1) Remove the attraction push-on roller unit.
2) Using a hex key, loosen the hex screw, and remove the spring clutch from the rear of the registration roller assembly.

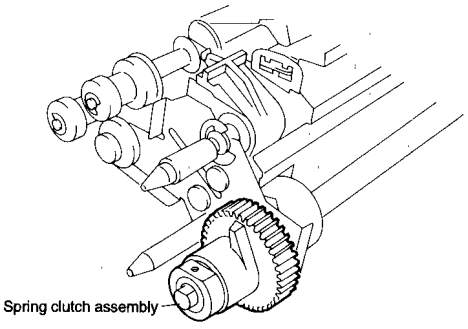


**Figure 4-1116**

3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw of the new spring clutch.
5) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.
   Further, when tightening the hex screw, be sure that the screw and the D-cut of the shaft are perpendicular.

**Caution:**
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch.

## 4. Transfer Cam Assembly Spring Clutch

1) Remove the rear cover, and open the DC controller PCB, and remove the support plate as shown in Figure 4-1119.
2) Remove the solenoid.
3) Remove the two screws, and remove the stopper.
4) Using a hex key, loosen the two hex screws, and remove the spring clutch.

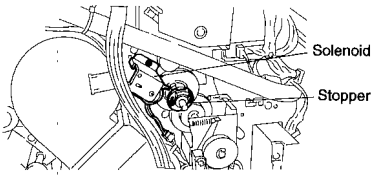


**Figure 4-1117**

5) Clean the shaft on which the spring clutch was found with alcohol.
6) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.

**Caution:**
When tightening the hex screws, keep the hole of the shaft facing up, and fit and tighten the screws in 9 and 12 o'clock direction.

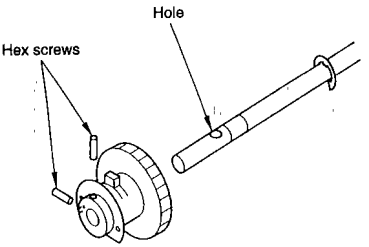


**Figure 4-1118**

If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.


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7) Install the spring clutch assembly while turning the stopper fully to the right.

**Caution:**
You must use a transparency to ensure the proper operation of the spring clutch by creating a gap. (You need not create a gap, however, if the spring clutch is of a large diameter.)

## 5. Transfer Drum Cleaner Spring Clutch

1) Remove the rear cover.
2) Open the DC controller PCB, and remove the support plate.

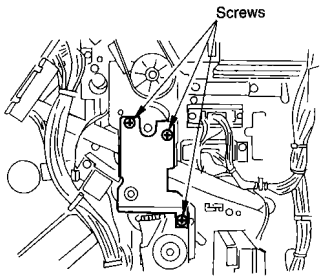


**Figure 4-1119**

3) Remove the drive belt; then, remove the two screws, and remove the support plate.

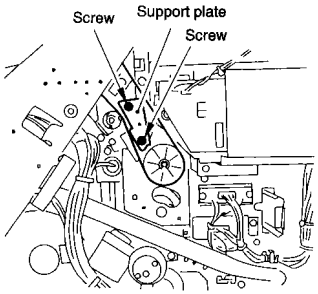


**Figure 4-1120**

4) Disconnect the connector; then, remove the two screws, and remove the transfer cleaner drive assembly.

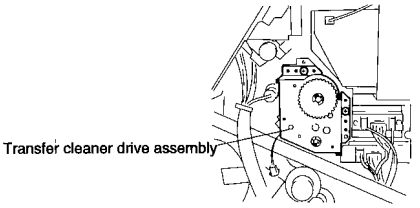


**Figure 4-1121**

5) Remove the screw, and remove the solenoid.
6) Remove the E-ring, washer, and bearing.

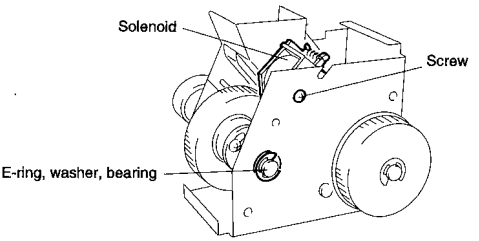


**Figure 4-1122**

7) Remove the two screws, E-ring, and bearing; then, divide the transfer cleaner drive assembly into two.

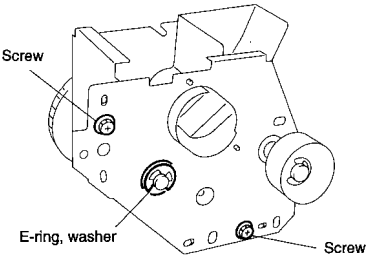


**Figure 4-1123**

8) Remove the two screws, and remove the stopper.

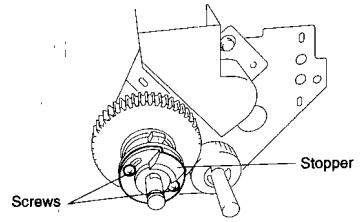


**Figure 4-1124**

9) Using a hex screw, loosen the two hex screws, and remove the spring clutch assembly.

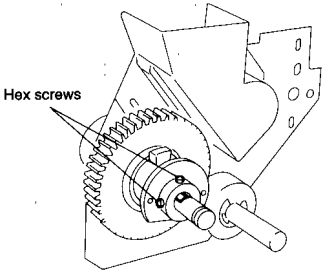


**Figure 4-1125**

10) Clean the shaft with alcohol.
11) Remove the stopper from the new spring clutch, and install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring.

**Caution:**
When tightening the hex screws, keep the hole of the shaft facing up, and fit and tighten the screws in 9 and 12 o'clock direction.

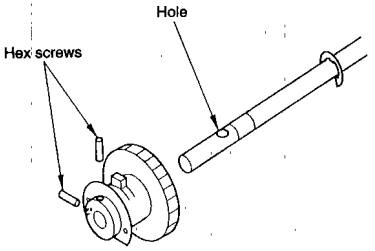


**Figure 4-1126**

If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.

12) Remove the transparency, and install the spring clutch with the stopper turned fully to the right.

## 6. Developing Assembly Locking Unit Spring Clutch

1) Remove the developing assembly drive unit.
2) Using the hex key, loosen the hex screw; then, remove the developing drive unit spring clutch.
3) Clean the shaft on which the spring clutch was found with alcohol.
4) Loosen the hex screw on the new spring clutch.


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5) Install the new spring clutch to the shaft. At this time, put one transparency cut to an appropriate width between the spring clutch and the E-ring, and install the spring clutch while butting it against the E-ring (If the new spring clutch is of a large diameter, you need not use a transparency; butt the spring clutch directly to the E-ring when installing it.). At this time, tighten the hex screw while keeping the shaft in place and turning the boss clockwise.

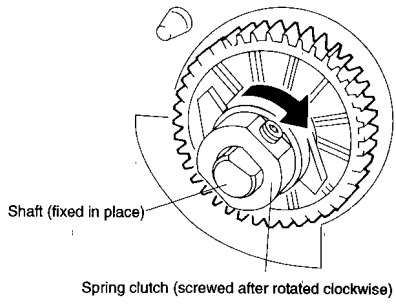


**Figure 4-1127**

**Caution:**
Be sure not to leave out the work of putting transparencies between parts so that a gap will be provided ensuring correct operation of the spring clutch. (You need not create a gap, however, if the spring clutch is of a large diameter.)

# XII. STANDARDS AND ADJUSTMENTS

## A. Mechanical

### 1. Non-Image Width

Make sure that the non-image width at the time of DIRECT with document detection off is as follows:

leading edge: 8.0 ±1.5 mm (8.0 ±2.0 mm)
left/right: 2.0 ±1.0 mm (2.0 ±1.5 mm)
trailing edge: 4.5 mm (4.5 mm)

The value in parentheses refers to the 2nd side of a two-sided copy.

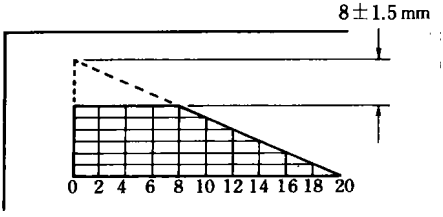


**Figure 4-1201 Leading Edge Non-Image Width**

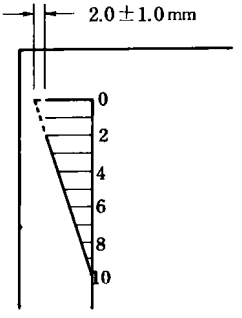


**Figure 4-1202 Left/Right Non-Image Width**

### 2. Image Margin

Make sure that the image margin at the time of DIRECT with document detection off is as follows:

leading edge: 8.0 ±1.5 mm (8.0 ±2.0 mm)
left/right: 2.0 ±1.0 mm (2.0 ±1.5 mm)
trailing edge: 4.5 ±1.5 mm (4.5 ±2.0 mm)

The value in parentheses refers to the 2nd side of a two-sided copy.

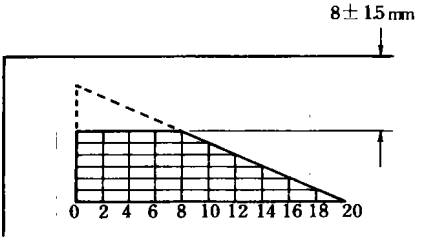


**Figure 4-1203 Leading Edge Image Margin**

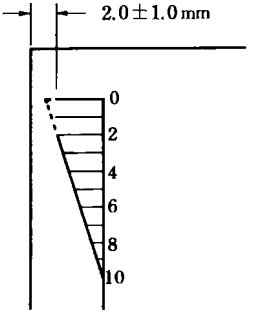


**Figure 4-1204 Left/Right Image Margin**


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## 3. Checking and Adjusting the Non-Image Width and Margin

Make checks/adjustments in the order indicated:

- left-right registration adjustment
- retention position adjustment (ATTRACT)
- image margin adjustment (TR-DELAY)
- image read start position adjustment (ADJ-XY)
- image margin check

### a. Adjusting the Left/Right Registration

1) Make 10 copies each from all the cassettes, multifeeder, and duplexing unit, and check the margin on left/right.
2) If the margin is outside the specification, adjust as follows:

- Pick-Up from the Cassette

1) Remove the cassette from the holder you want to adjust.
2) Turn the adjusting screw 1 to adjust the horizontal registration plate so that the horizontal registration on the copy image is 2 ±1 mm.

To increase the registration at the front,
↓
Turn the adjusting screw counterclockwise (a single turn will lead to a change of about 0.7 mm).

To increase the registration at the rear,
↓
Turn the adjusting screw clockwise (a single turn will lead to a change of about 0.7 mm).

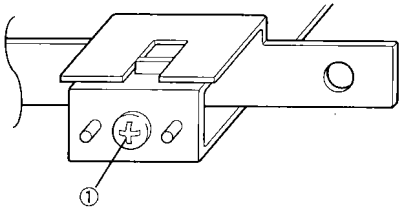


Figure 4-1205a

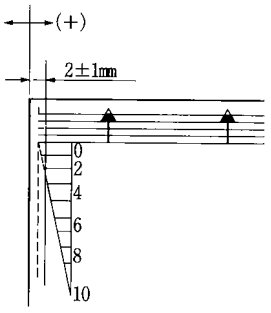


Figure 4-1205b

- Pick-Up from the Multifeeder
  Loosen the screw ①, and move the tray until 0 ±1.5 mm is met in DIRECT.

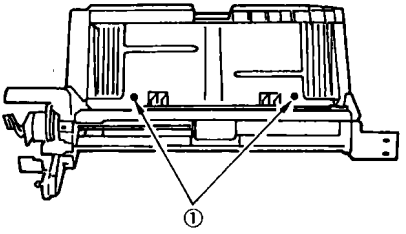


Figure 4-1206

- Two-Sided Copies
  Loosen the screw ①, and move the paper jogging guide plate until 0 ±1.5 mm is met in DIRECT.

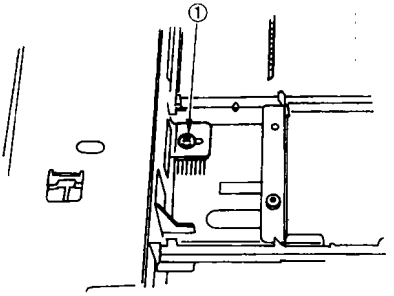


Figure 4-1207

### b. Adjusting the Point of Retention (ATTRACT)

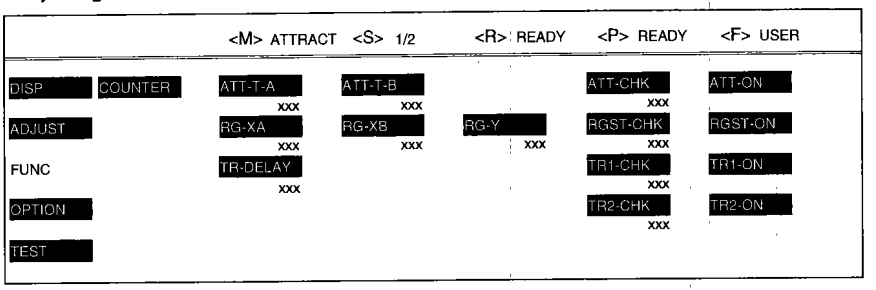


**Figure 4-1208**

1) Activate service mode.
2) Select 'FUNC'.
3) Select 'ATTRACT'.
4) Press 'ATT-CHK', and set it to '1', i.e., double-side retention of side B and side A.
5) Press 'ATT-ON.
   - Copy paper is picked up, retained, and stopped.
6) Pull out the transfer assembly frame.
7) Place a ruler or copy paper on the marking (Figure 4-1209) made in the transfer drum ring (front, rear), and measure point 'd' along the leading edge of the copy paper in relation to the marking. Take measurements for both side A and side B.

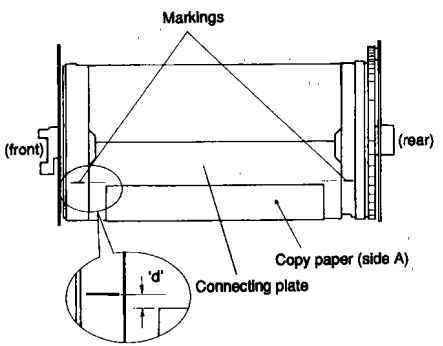


**Figure 4-1209**

8) For side A, select 'ATT-T-A' and for side B, select 'ATT-T-B'; then, make adjustments so that 'd' is 0 ±0.5 mm.
   - A change by '1' for 'ATT-T-A' or 'ATT-T-B' changes the point of retention by about 0.1 mm.
   - A higher setting *delays* the point of retention for copy paper (➨ direction); on the other hand, a lower setting *advances* the point of retention for copy paper (➨ direction).

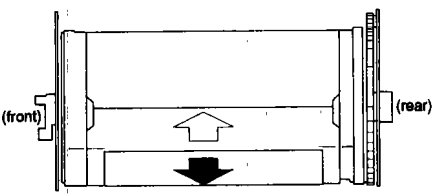


**Figure 4-1210**

9) After adjustment, turn the power switch off and then on.
   - You must turn the power switch off and then on, or the copy will not carry any image.


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### c. Adjusting the Image Leading Edge Margin (RG-XA, RG-XB)

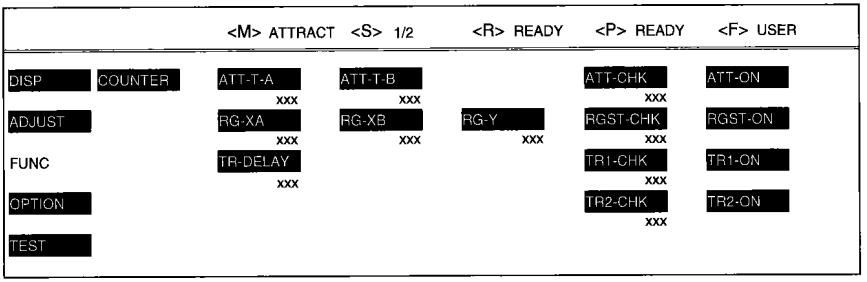
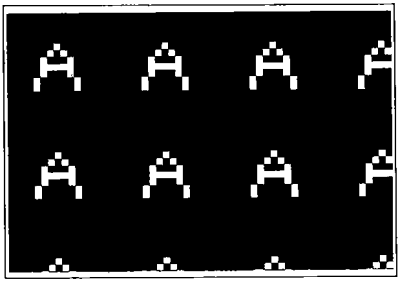
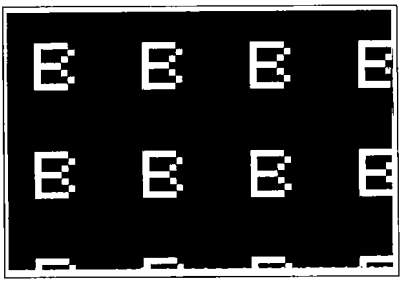



**Figure 4-1211**

1) Activate service mode, and select 'ATTRACT' under 'FUNC' in service mode.
2) Press 'RGST-CHK', and set it to '1', i.e., double-side retention of side B and side A.
3) Press 'RGST-ON'.
   - A total of two test prints will be generated (Figure 4-1212).



Output of side A



Output of side B

**Figure 4-1212**

4) Measure the leading edge margin 'd' on the prints; take measurements on both side A and side B.

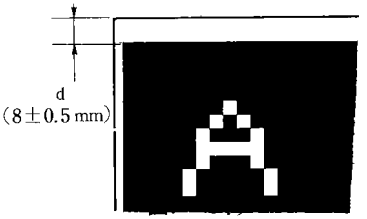



**Figure 4-1213**

5) For side A, select 'RG-XA' and for side B, select 'RG-XB'; then, make adjustments until d is 8 ±0.5 mm.
   - A change by '1' changes the leading edge margin by about 0.1 mm.
   - A higher setting increases the leading edge margin; a lower setting, on the other hand, decreases the leading edge margin.

### d. Adjusting the Transfer Delay (TR-DELAY)

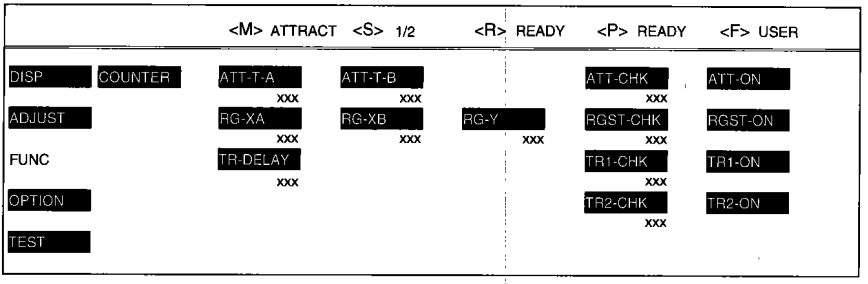
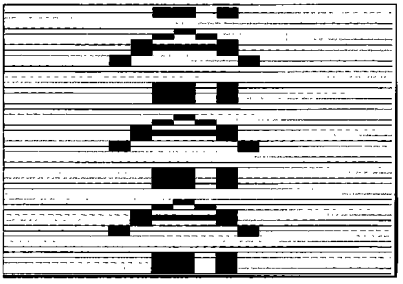
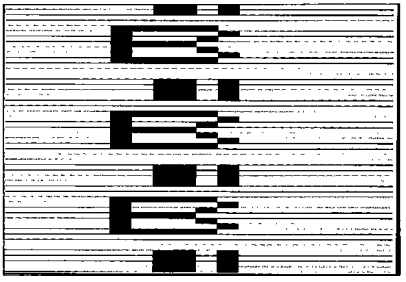



**Figure 4-1214**

1) Activate service mode, and select 'ATTRACT' under 'FUNC'.
2) Press 'TR1-CHK', and set it to '1', i.e., double-side retention for side B and side A.
3) Press 'TR1-ON'.
   - A total of two test prints will be generated.



Test Print of Side A



Test Print of Side B

**Figure 4-1215**

4) Measure the transfer delay 'd' on the generated image of side B.

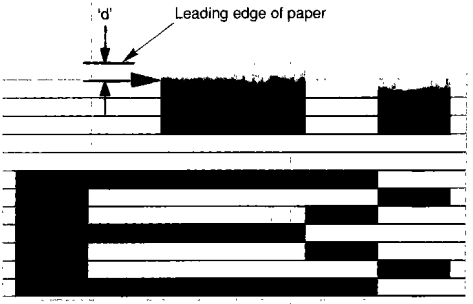



**Figure 4-1216**

5) Select 'TR-DELAY', and make adjustments by changing the setting so that d is 3 ± 0.5 mm.
   - A change by '1' changes the transfer delay by about 0.1 mm.
   - A higher setting increases the transfer delay; a lower setting, on the other hand, decreases the transfer delay.
6) Press 'TR2-CHK', and set it to '1', i.e., double-side retention of side B and side A.
7) Press 'TR2-ON'.
8) Check the leading edge margin (8 ± 0.5 mm) on the printout.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### e. Adjusting the Image Read Start Position(ADJ-XY)

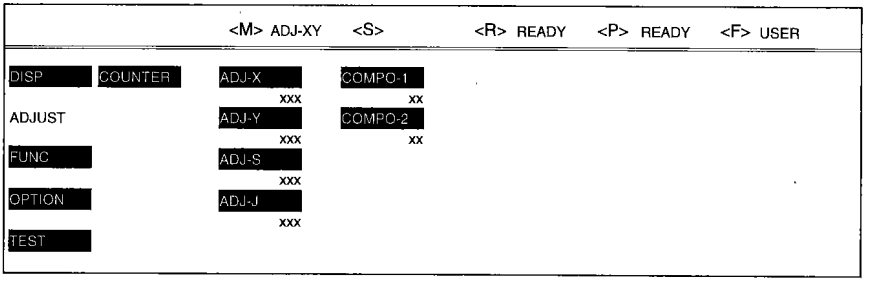


**Figure 4-1217**

1) Activate service mode, and select 'ADJ-XY' under 'ADJUST'.
2) Press the Copy Start key while the ADJ-XY screen is displayed.
   - The appropriate copy mode is set automatically, and a copy is made with a shift of about 50 mm as shown in Figure 4-1218.
3) If the part of the image is missing, decrease the setting of 'ADJ-X' and 'ADJ-Y'.
4) If the image includes areas outside the image area, increase the setting of 'ADJ-X' and 'ADJ-Y'.
5) Press the Copy Start key once again, and check.
6) Press the Reset key.

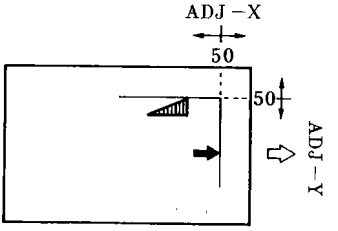


**Figure 4-1218**

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## 4 Changing the Image Trailing Edge Margin

The standard for the image trailing edge margin is 4.5 ±1.5 mm. If the user requests a change, the trailing edge margin may be adjusted to 2.5 ± 1.5 mm after satisfying the conditions given under a.

**a. Conditions**

Make sure of the following to avoid drum memory caused by moist copy paper in a high-humidity environment:

- Install the cassette heater.
- Advise the user to prohibit the use of most paper.
- Advise the user to prohibit the use of the cassette 1 for Hammermill paper.
- Keep in mind that the trailing edge margin will be fixed to 4.5 mm for copies made in manual feeding or for the first side of a two-sided copy.

**b. Steps**

1) For the special transfer timing, see c.
2) For setting the trailing edge margin to 2.5 mm, see d.


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### c. Adjusting the Special Transfer Timing

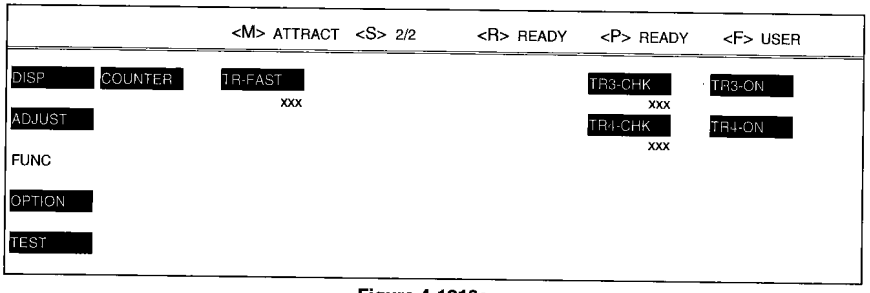
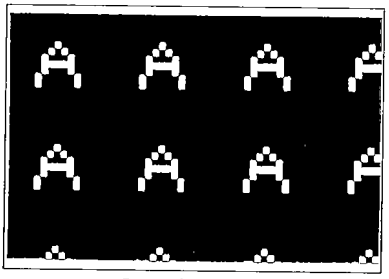
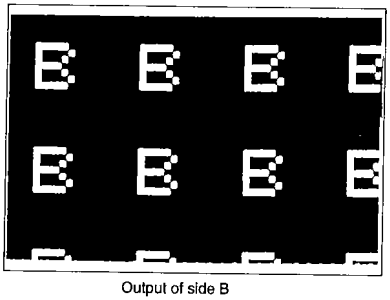



**Figure 4-1219a**

1) Activate service mode, and select 'ATTRACT' under 'FUNC'; then, press the Interrupt key.
2) Press 'TR-3CHK', and set it to '1' (2-sheet attraction mode; side A and side B).
3) Press 'TR-3ON.
   - A total of two print-outs will be generated (one each of the following).



Output of side A



Output of side B

**Figure 4-1219b**

4) Using the print-out of side B, measure the trailing edge transfer special timing length d.

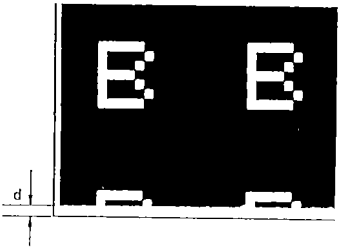



**Figure 4-1219c**

5) Select 'TR-FAST', and change the setting so that the d measured in step 4) will be $2.0 \pm 0.5$ mm.
   settings: -127 to 127
   unit: 0.1mm (A higher setting will result in a lower d.)
6) Press 'RGST-CHK' under 'ATTRACT', set the item to '1' (2-sheet retention for B-/A-side).
7) Press 'RGST-ON' under 'ATTRACT'. (An image with a trailing edge margin of 4.5 mm will be generated.)
8) Check to make sure that the trailing edge of the printed image is not blurred.

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### d. Setting the Trailing Edge Margin to 2.5 mm

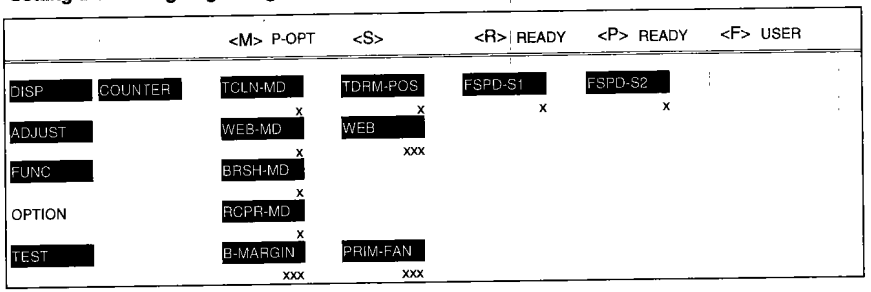


**Figure 2-1219d**

1) Press 'B-MARGIN' under 'OPTION' in service mode.
2) Set 'B-MARGIN' to '1'.
   0: trailing edge margin 4.5 mm
   1: trailing edge margin 2.5 mm
3) Select 'ATTRACT' in service mode, and press the Interrupt key.
4) Press 'TR-4CHK', and set it to '1' (2-sheet attraction mode; side B and side B).
5) Press 'TR-4ON'.
   - Check to make sure that the trailing edge margin of the printed image is 2.5 mm.

**Caution:**
The same level of high voltage for transfer is for both normal and special transfer regardless of the setting of 'B-MARGIN' of 'P-OPT' under 'OPTION'.
To reset the trailing edge margin from 2.5 mm to 4.5 mm, you must make the necessary changes for special transfer timing in addition to changing '1' to '0' for 'B-MARGIN' of 'P-OPT' under 'OPTION'. Failure to do so can lead to drum memory.


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## 5. Installing the Photosensitive Drum

1) Put drum cleaner lubricant evenly along the No. 2 blade of the black toner density sensor.

**Caution:**
1. Be sure to mix the lubricant well by shaking its container before application.
2. Be sure to apply the lubricant to both sides (A and B) as well as the edges of the blade.
3. Do not rub in the lubricant, or the edge may chip; apply as if to tap on the edge.

2) Apply the drum cleaner lubricant evenly over the blade in the photosensitive drum cleaning assembly.

**Caution:**
1. You need not perform the step if you have replaced the cleaning blade. Blades available as service parts are pre-coated with lubricant.
2. Shake the lubricant well before application.
3. Apply to sides A and B as well as the edge of the blade.
4. Do not apply as if to rub in the lubricant, or you could chip the edge; tap lightly.
5. If the application is not even, the copies may carry white vertical lines.

3) Dry-wipe the surface of the black toner density sensor.

**Caution:**
1. Do not use alcohol.
2. Take care not to touch the photosensitive drum.

4) Hold both ends of the photosensitive drum, and put it carefully into the unit along the guide rail ① of the photosensitive drum unit.

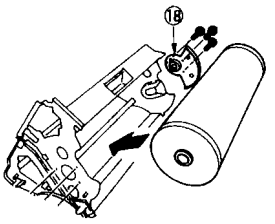
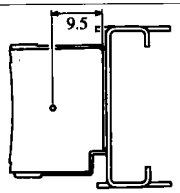
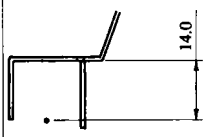
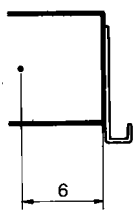



**Figure 4-1219**

5) Fix the butting block (front, rear) with six screws.
6) Install the photosensitive drum unit to the copier.
7) Connect the connector of the black density sensor, and install the photosensitive drum cleaner and primary corona assembly.
8) Replace the black developer.
9) Execute 'INIT-K' under 'INSTALL' under 'FUNC' of service mode to store the toner density data.
10) Execute auto gradation correction in user mode.

## 6. Height of the Corona Wires

| Corona unit | Height of corona wire (mm) | Adjustable (mm; approx.) |
|---|---|---|
| Primary corona unit |   | 4 |
| Separation corona unit |   | 4 |
| External stalic eliminator corona unit |   | 4 |

**Note:**

The height of each corona wire can be adjusted by turning the screw behind the corona unit; a full turn of the screw changes the position of the corona wire by about 0.7 mm.

*However, you cannot adjust the height of the transfer charging assembly, internal static eliminating assembly, or retention assembly.

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## 7. Replacing the Developer

1) Open the front door (left, right), and remove the two screws ①; then, remove the hopper unit stopper fixing.

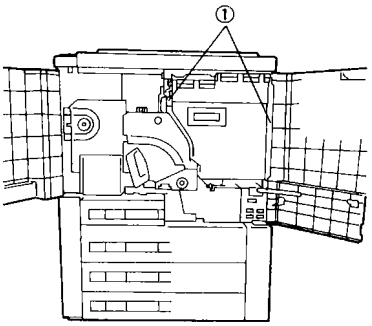


**Figure 4-1220**

2) Fully open the hopper unit.
3) Remove the cap ② from the outlet found at the bottom front of the developing assembly whose developer you want to replace.
   Place a plastic bag ③ or the like to receive developer; a fair amount of developer will fall out of the developing assembly.

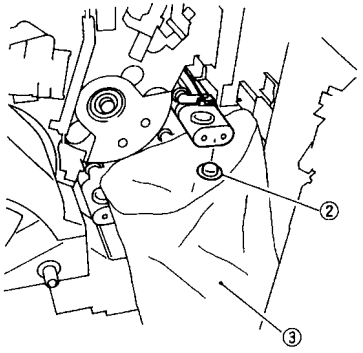


**Figure 4-1221**

4) Elect 'INSTALL' under 'FUNC' in service mode.
5) While holding a plastic bag over the outlet, press 'RECV-M/C/Y/K' according to the color of the developer you are replacing.
   - Stop the operation by pressing the Stop key (▼) when the developer stops pouring.
6) Attach the cap to the outlet.
7) Remove the screw, and remove the developing assembly; then, remove the cap from the outlet.
   - If you are removing Bk developing assembly, disconnect the connector.
8) While tilting the developing assembly, turn the gear by hand to pour out the developer.
   At this time, tilt the developing assembly further as you turn the gear until the developing assembly is fully upright and all developer has fallen out.

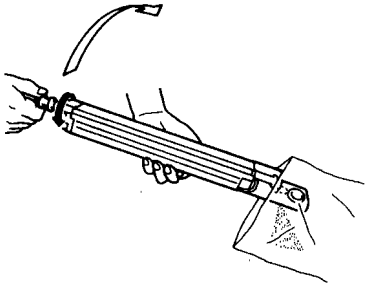

**Figure 4-1222**

9) Attach the cap to the outlet.
10) Install the developing assembly to the copier.
11) When the machine has completed warm-up, select 'INSTALL' under 'FUNC' in service mode.
12) Press 'SPLY-M/C/Y/K' according to the color of the developer you are replacing.
13) Check that the developing assembly becomes engaged and the screw inside the developing assembly starts to rotate.

14) Fit the developer funnel (accessory) in the supply mouth of the developing assembly.

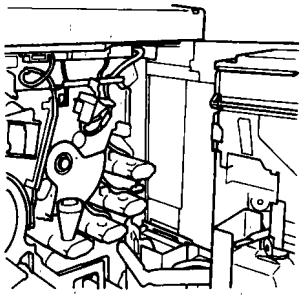

**Figure 4-1223**

15) Put developer into the developing assembly.
- Tilt the container of the developer as you turn it to avoid spilling.

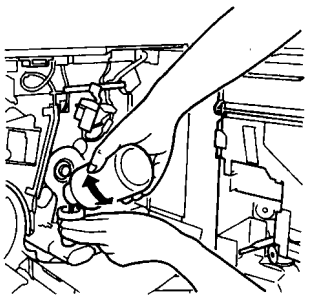

**Figure 4-1224**

16) When you have put all developer, press the Stop key.
17) Execute 'STIR-Y/M/C/K' in service mode.
Wait until the notation of <P> on the display changes from '<P> SERVICE' to '<P> READY'.
18) Execute 'INIT-Y/M/C/K' in service mode.
Wait until the notation of <P> on the display changes from '<P> SERVICE' to '<P> READY'.
19) Fill out the Service Data Sheet with ATR-related data.


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## 8. Orientation of the Pick-Up Roller (cassette pick-up assembly, duplexing pick-up assembly)

Install the pick-up roller ① to the pick-up assembly so that the round marking ② found on its rubber portion is toward the front.

for front, use brass
for rear, use silver

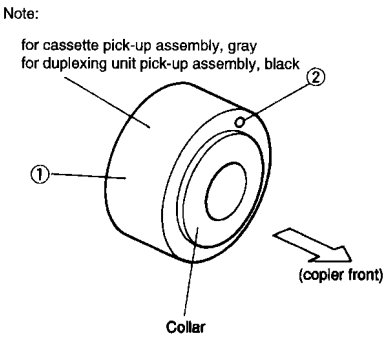



Figure4-1225

## 9. Orientation of the Separation Roller (cassette pick-up assembly, duplexing unit pick-up assembly)

Install the separation roller ① to the pick-up assembly so that the D-cut in the collar is toward the front.

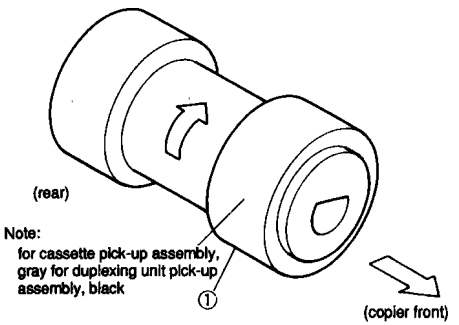



Figure 4-1226

## 10. Orientation of the Feeding Roller (cassette pick-up assembly) and Feeding Roller 1 (duplexing unit pick-up assembly)

Install the feeding roller ① to the pick-up assembly so that the belt pulley ② attached to the separation roller is toward the rear.

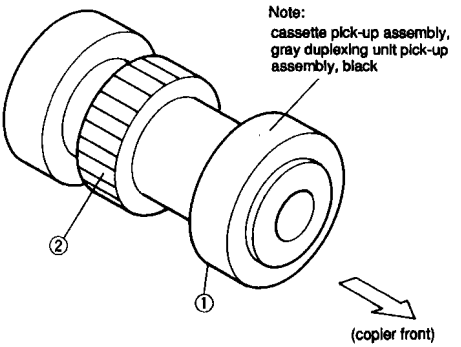



Figure 4-1227

## 11. Orientation of the Feeding Roller 2 (duplexing unit pick-up assembly)

Install the feeding roller 2 ① so that the round marking ② in the rubber portion is toward the front.

for front, brass
for rear, silver

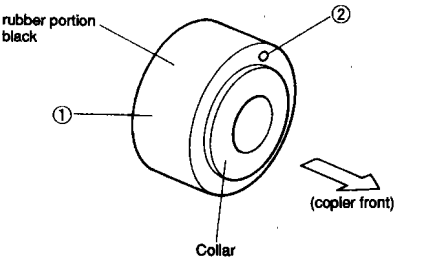


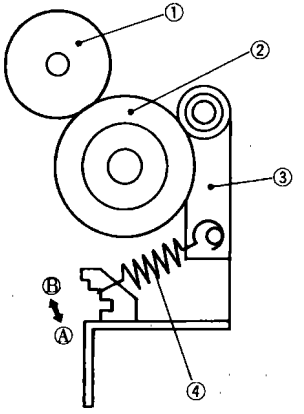

Figure 4-1228

## 12. Adjusting the Pressure of the Separation Roller

If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the pressure spring of the separation roller.

① If double-feeding occurs, move the spring hook in the direction of arrow Ⓐ.

② If pick-up failure occurs, move the spring hook in the direction of arrow Ⓑ.




① Feeding roller
② Separation roller
③ Pressure lever
④ Pressure spring

**Figure 4-1229**

## 13. Positioning the Pick-Up Assembly Pick-Up Roller Releasing Solenoid (SL16, SL17, SL18, SL19)

Install the solenoid so that the roller arm ① shown in Figure 4-1229 butts against the upper stay ② when the solenoid plunger is pushed in.

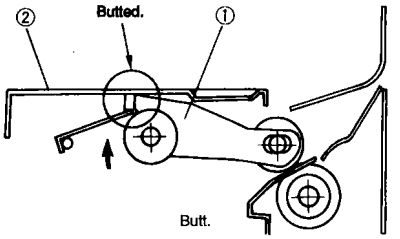



**Figure 4-1230**

## 14. Orientation of the Multifeeder Pick-Up Roller

Install the multifeeder pick-up roller ① so that the side with the collar marked with a cross ② is toward the rear.

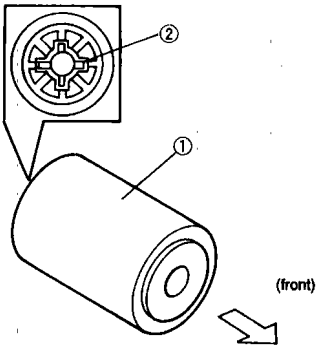



**Figure 4-1231**

## 15. Position of the Multifeeder Assembly Paper Guide Plate Cam

Adjust the engagement of the 26T gear 1 and 26T gear 2 so that the paper guide plate and paper guide plate cam are positioned as shown in Figure 4-1231 when the solenoid plate is in contact with the claw of the control ring.

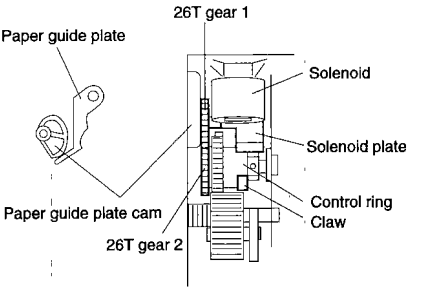



**Figure 4-1232**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## 16. Attaching the Timing Belt in the Multifeeder Assembly

Butt the rack plate of the multifeeder against A (open state).

Move the slide volume in the direction of B, and attaching the timing belt to the pulley.

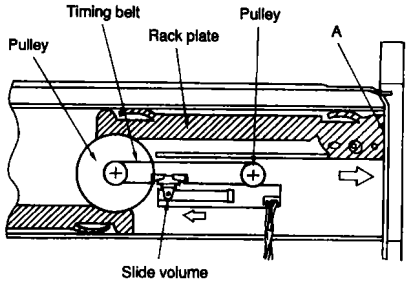


**Figure 4-1233**

## 17. Adjusting the Pressure of the Multifeeder Assembly Separation Pad

If double-feeding or pick-up failure occurs during pick-up operation, adjust the position of the separation pad pressure spring.

① If double-feeding occurs, move the position of the spring holder in the direction of A.

② If pick-up failure occurs, move the position of the spring holder in the direction of B.

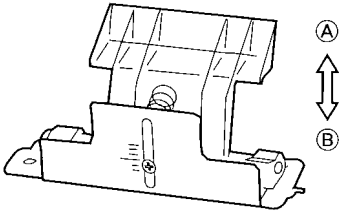


**Figure 4-1234**

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## 18. Position of the Delivery Paper Deflecting Plate Drive Solenoid (SL20)

1) Place the delivery assembly upright on a level surface.

2) Loosen the adjusting screw and make adjustments so that the paper deflecting plate butts against the delivery paper upper guide when the solenoid is on (viewing the delivery assembly from the rear). (See Figure 4-1235.)

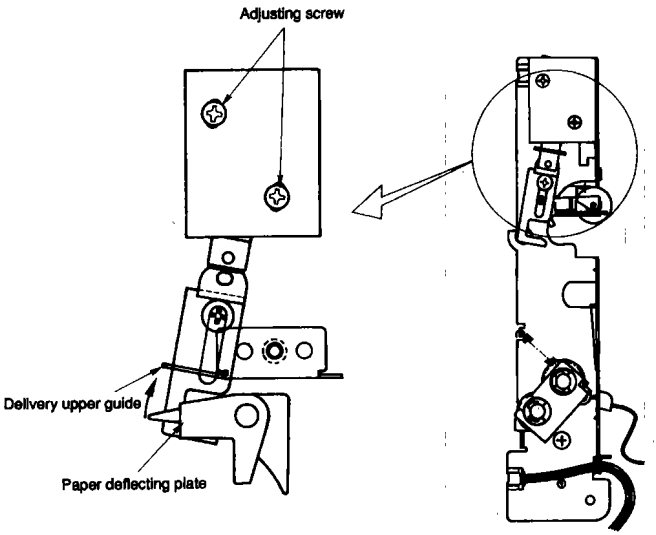


**Figure 4-1235**


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## 19. Routing the Scanner Drive Cable

For instructions on how to route the scanner drive cable, see Chapter 4 "Routing the Scanner Drive Cable" in the Service Manual.

**Caution:**
Take care not damage the wire by the edge of the metal plate.

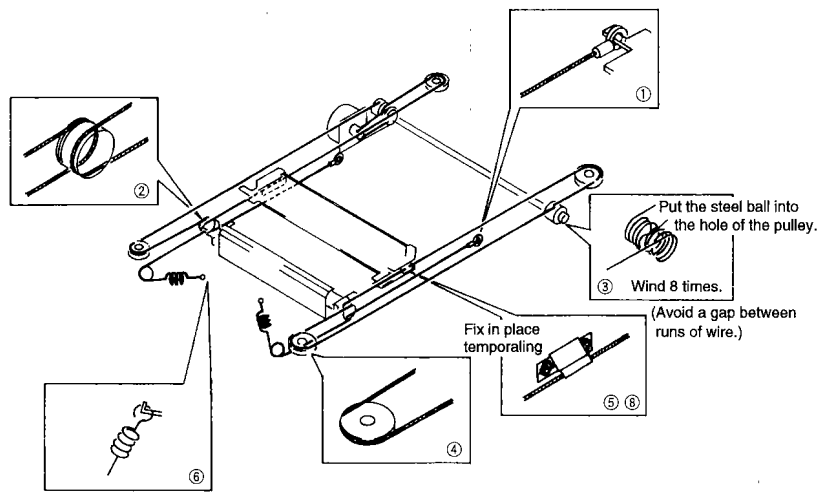
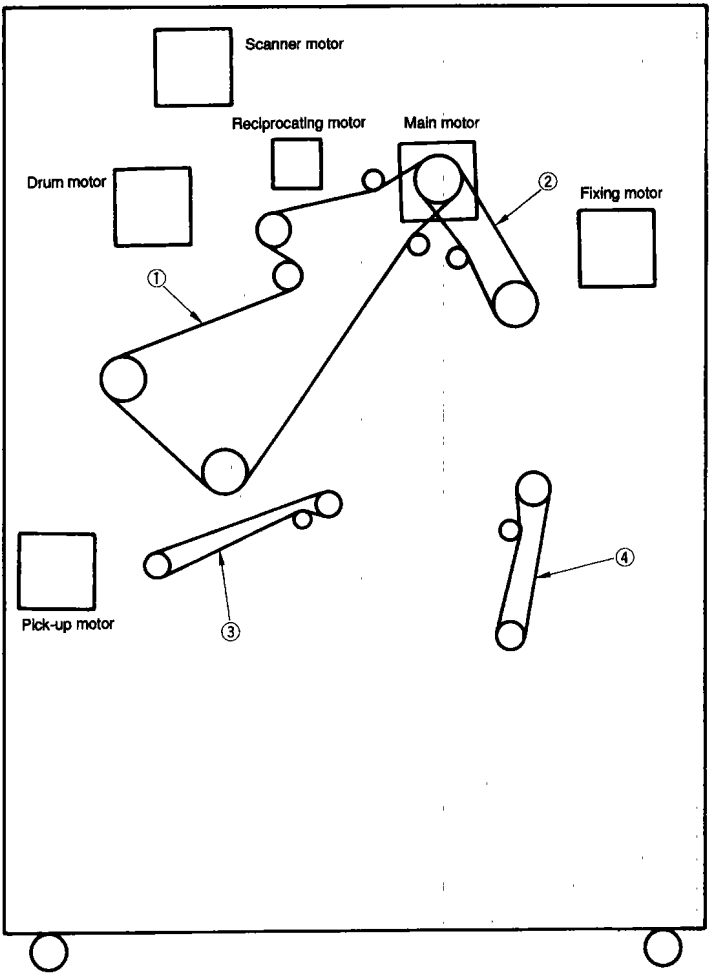



**Figure 4-1236**

**Caution:**
1. Make sure that the scanner cable is free of twists and it has not ridden over the pulley.
2. Move the No. 1 and No. 2 mirror mounts by hand to make sure that they move smoothly. At this time, do not touch the reflecting plate.

## 20. Routing the Drive Cables

See Figure 4-1237 for how to route the drive cables.




① Developing assembly, registration, photosensitive drum cleaner drive cables
② Feeding assembly, delivery feeding assembly drive cables
③ Pick-up assembly drive belt
④ Duplexing unit feeding assembly drive belt

**Figure 4-1237**

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## 21. Points to Note When Replacing the Fixing Heater

- Do not touch the surface of the heater.

**Reference:**

Both upper and lower fixing heaters are of the same type; moreover, the heaters do not have orientation (front/rear).

## 22. Adjusting the Nip (adjusting the nut for the fixing assembly pressure)

- The nip is correct if it is within the value shown in Table 4-1. Otherwise, turn the adjusting nut.

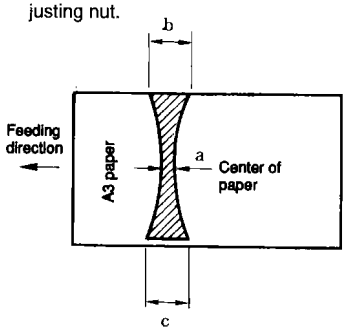


**Figure 4-1238**

**Note:**

b and c refer to points 10 through 15 mm from the edge of paper.

| Dimensions | Measured when both upper and lower rollers are sufficiently heated. |
|---|---|
| a | 7 ±0.5 (mm) |
| \| b – c \| | 0.5 (mm) or less |
| b – a<br>c – a | 1 (mm) or less |

**Table 4-1**

- Measuring the Nip Width

  If you are taking measurements while the rollers are cold, wait 15 min after standby and make 20 copies before taking measurements.

- Taking Measurements

1) Activate service mode.
2) Select 'FUSER' under 'FUNC', and press 'NIP-CHK' to execute the mode. (The operation ends when the notation of <P> changes from 'READY' to 'SERVICE' to 'READY'.)

## 23. Adjusting the Home Position of the Duplexing Unit Stacking Assembly Paper Jogging Plate

1) Select A4R or LTR-R; then, copy on the 1st side of a two-sided copy.
2) Slide out the duplexing unit toward the front.
3) Measure the distance L of the paper jogging plate ①.

   A4R: L=210 ±0.3 mm

   LTR-R: L=216 ±0.3 mm

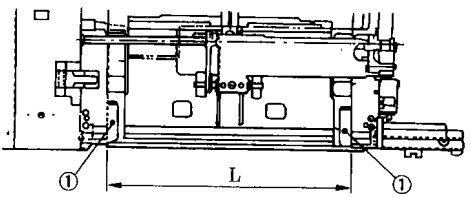


**Figure 4-1239**

4) If the measurement is outside the specification, remove the front cover of the holding plate.
5) Loosen the screw ②, and turn the adjusting screw ③ to adjust the position of the paper jogging guide plate home position sensor.

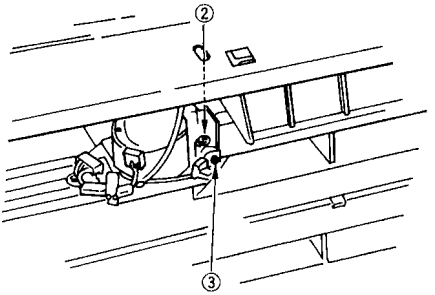


**Figure 4-1240**

## 24. Adjusting the Position of the Duplexing Unit Stacking Assembly Paper Feeding Roller Down Solenoid (SL22)

Let the feeding roller drop on its own weight to the bottom of the duplexing unit stacking assembly.

At this time, keep the plunger of the solenoid pushed, and fix the solenoid ③ in place so that the distance between the edges of the lever ① and arm ② is 1.5 ±0.5 mm.

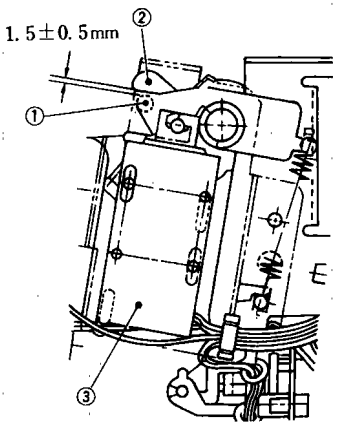


Figure 4-1241

## 25. Positioning the Duplexing Unit Pick-Up Assembly Pick-Up Roller Releasing Solenoid (SL21)

1) Remove the duplexing unit pick-up assembly.
2) Place the duplexing unit pick-up assembly as shown in Figure 4-1241; then, lift the lever ① so that the pick-up roller ② drops on its own weight.
3) Adjust the pick-up roller releasing solenoid (SL21) so that the length L is 65 ±1 mm.

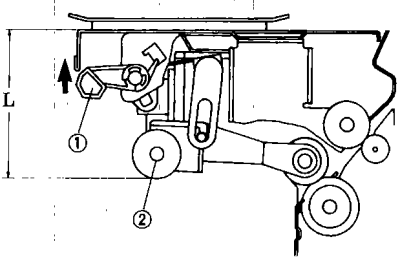


Figure 4-1242


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## 26. Adjusting the Drive Belt for the Duplexing Unit Stacking Assembly Feeding Roller

Fix the idler mount ① while pushing it in the direction of the arrow with a force of 250 g.

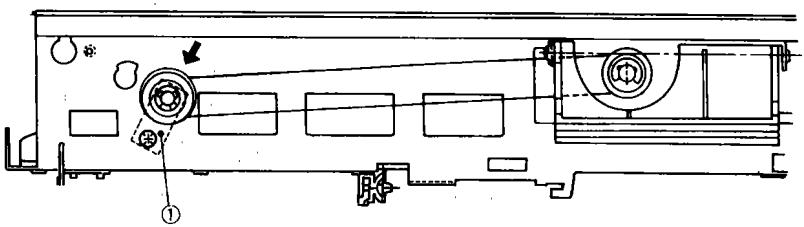


Figure 4-1243

## 27. Adjusting the Drive Belt for the Duplexing Unit Feeding Assembly

Fix the tension mount ① in place while pushing it in the direction of the arrow with a force of 450 ±50 g.

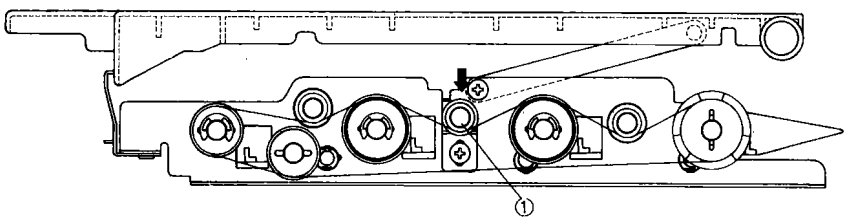


Figure 4-1244

## 28. Positioning the Duplexing Unit Stacking Assembly Stopper Plate Drive Solenoid (SL27)

Install the solenoid ③ so that the gap between the shutter plate ① and pin ② is 0.5 mm when the plunger of the solenoid is pushed in.

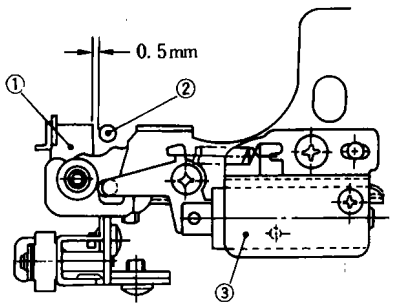


Figure 4-1245

## 29. Attaching the Timing Belt for the Duplexing Unit Stacking Assembly Paper Guide Plate

Install the gear ① with the paper jogging guide plate fully open.

Attach the timing belt ③ to the gear ① and pulley ②.

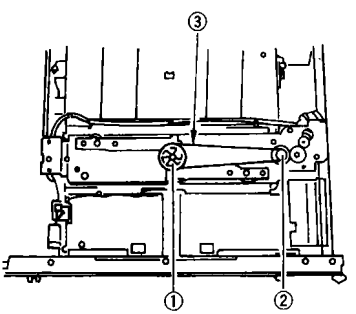


Figure4-1246

## 30. Positioning the Photosensitive Drum Fixing Shaft

Slide out the photosensiitive drum frame unit about 5 cm from the machine, and insert it back into the machine once again.If the photosensitive drum frame unit cannot be moved smoothly at this time, adjust the position of the photosensitive drum fixing shaft using the drum shaft positioning tool (FY9-3016-000) as follows:

(You need not adjust the position if the copied are free of color displacement, blurring, or pitch discrepancy and the discrepancy between the photosensitive drum fixing shaft and the hole of the photosensitive drum flange is no more than 1 mm and, therefore, the drum fixing shaft may be corrected by hand.)

1) Remove the flywheel.
2) Remove the photosensitive drum frame unit from the machine.
3) Remove the photosensitive drum from the photosensitive drum frame unit.
4) Insert the photosensitive drum frame unit ① into the machine, and fix it in place using three screws ②. At this time, keep the following removed: photosensitive drum, photosensitive drum butting block(front, rear), photosensitive drum center fixing roll, black toner density sensor, photosensitive drum cleaner unit, primary corona assembly, and photosensitive drum cleaner front paper sensor .

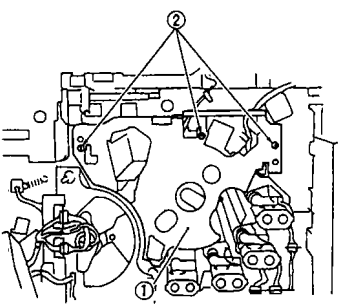


Figure 4-1247

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5) Loosen the seven fixing screws ③ of the drum motor assembly. (If the drum shaft support plate fixing ④ is found, remove it.)

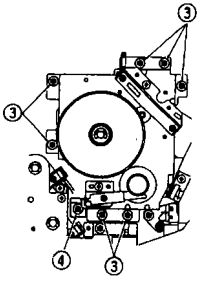


**Figure 4-1248**

6) Attach the drum shaft positioning tool ⑤ to the photosensitive drum frame unit ⑥ using the two screws ⑦ removed in step 3). (Pay attention to the orientation of the positioning tool.)

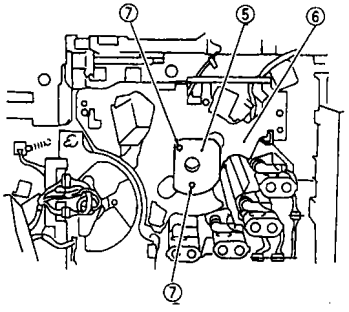


**Figure 4-1249**

7) Tighten the seven screws on the drum motor loosend in step 5).
8) Install the unit and parts removed in step 5).
9) Detach the drum shaft positioning tool, and remove the photosensitive drum frame unit from the machine; then , install it back to the machine together with the unit and parts removed in step 2), 3), and 4).
10) Install the flywheel, and install the external covers.

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## 31. Adjusting the Transfer Separation Claw Position

Perform the following steps when replacing the transfer sheet.

1) Peel off the transfer sheet.
2) Rotate the transfer drum ring so that the transfer drum connecting plate is opposite of the transfer drum separation claw roll.
3) Push the positioning roll of the transfer drum separation claw so that it comes into contact with the transfer drum ring butting rubber. (Avoid excessive force.)
4) Check to make sure that the distance between the transfer separation claw roll and the transfer drum connecting plate is 0.1 to 0.7 mm using a gap gauge (CK-0057 or CK-0061).
   Note that a Canon-recommended transparency is about 0.1 mm thick, while the gap gauge CK-0057 is 0.3 mm max. and CK-0061 is 0.45 mm thick max.

**Caution:**
Be sure to measure the highest point of the separation claw roller and the connecting plate.

5) If the gap measured in step 4) is not within the standard, loosen the screw (glued in place), and adjust the position of the separation claw.
6) Repeat steps 3) through 5) until the gap between the separation claw roll and the connecting plate is as specified.
7) If the gap fails to fall within the standard, replace the transfer separation claw assembly, and make adjustments by performing steps 3) through 5).
8) Attach the transfer sheet.

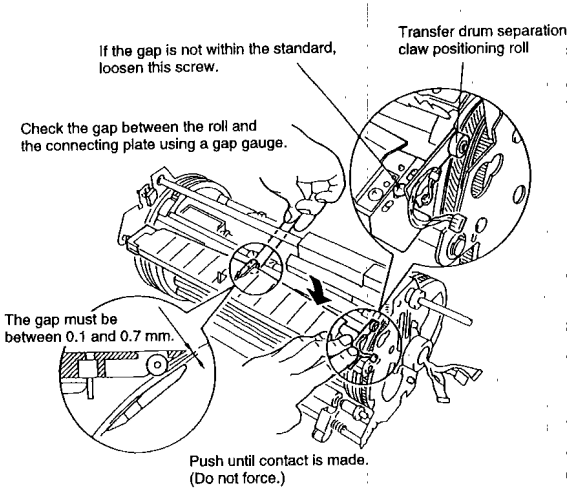
If the gap is not within the standard, loosen this screw.
Transfer drum separation claw positioning roll
Check the gap between the roll and the connecting plate using a gap gauge.
The gap must be between 0.1 and 0.7 mm.
Push until contact is made. (Do not force.)

**Figure 4-1250**


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# I. SELECTING THE SITE OF INSTALLATION

Make the following considerations when selecting the site of installation.

Visit the user before delivery of the machine to make sure that the site meets all the requirements.

1) There must be a grounded power outlet capable of providing the rated voltage ±10%. In addition, the outlet must be available exclusively for the machine—sharing it with a refrigerator or the like, which keeps turning on and off, causes voltage fluctuations, affecting the copy images.

2) The temperature and humidity of the site must be within the range shown in Figure 5-1. In particular, avoid spots near water faucets, water boilers, humidifiers, and refrigerators.

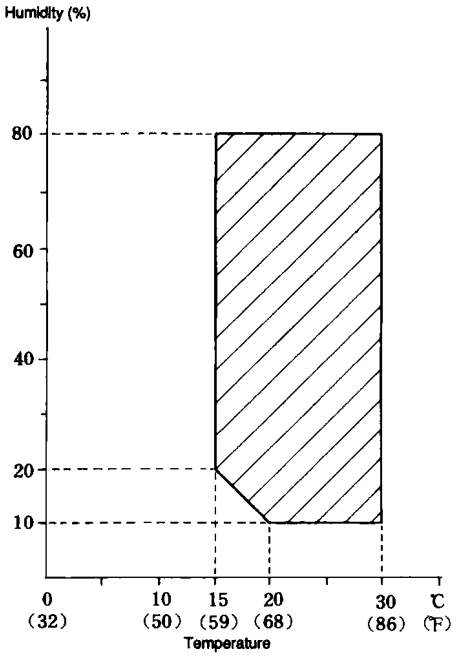


**Figure 5-1 Site Environment**

3) Avoid spots near sources of fire or spots subject to dust or ammonium gas. Avoid spots subject to direct rays of the sun; otherwise, provide curtains.

4) Make sure the room is well ventilated.

**Caution:**
The level of ozone generated by the machine will not affect the health of the individuals near it; however, it is best to make sure that the site is adequately ventilated, as some find the odor unpleasant.

5) Make sure the floor can support the machine level, and the machine's feet will remain in contact with the floor.

6) Make sure the site will allow adequate space for maintenance and copying work.

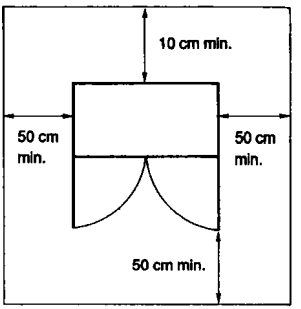


**Figure 5-2**

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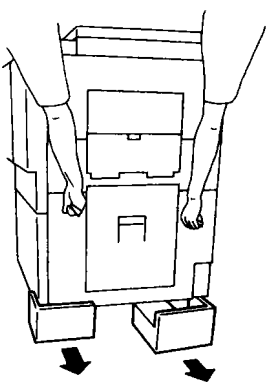
# II. INSTALLING THE MACHINE

Bringing in metal objects from a cold to warm place causes droplets of water to form on surfaces. This phenomenon is known as *condensation*, and condensation in a copier can lead to generation of blank copies. To prevent such a problem, leave the machine alone for at least one hour, and make sure that it has become acclimatized to the room temperature before beginning work.

## A. Unpacking

| No. | Step | Remarks |
|---|---|---|
| 1 | Open the shipping box. | |
| 2 | Tear the plastic bag containing the copier, and remove the fixing tape; then, pull out the grips. | |
| 3 | The copier weighs about 300 kg; take sufficient care when performing the work.<br>Work in a group of two—lift the pick-up side (right side) about 5 cm, and pull out the cushion material from the bottom in the direction of the arrows. |  |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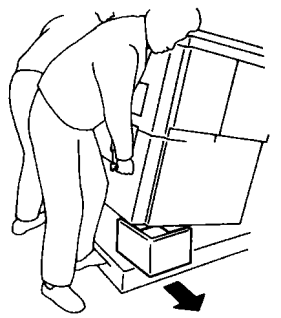
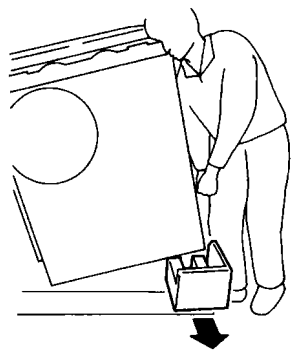
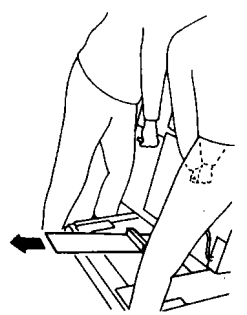
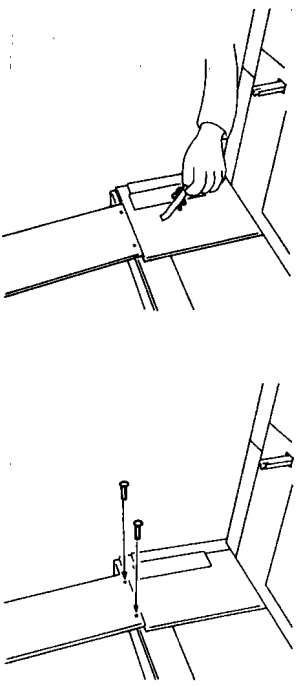
| No. | Step | Remarks |
|---|---|---|
| 4 | Work in a group of two—lift the delivery side (left side), and remove the cushion material from the bottom in the direction of the arrows. |   |
| 5 | Work in a group of two—lift the pick-up side (right side), and pull out the cardboard from the bottom, and remove the slope plate. |  |

| No. | Step | Remarks |
|---|---|---|
| 6 | Remove the two pins attached with tape; set the slope plate, and fix it in place using the pins. (Make sure that the boss in the middle faces down.) |  |
| 7 | Slide the copier down the skid. (Work in a group of two—one pushing the copier and the other, supporting it from its bottom.) | |
| 8 | Take out the parts and accessories from the cardboard box that came with the machine.<br><br>Take out the M, C, Y, and Bk starter developers, and shake them well; peel off the seals, and keep them in a place free of dust.<br>This is to acclimatize the starter developers. | Make sure that none of the following parts and accessories are missing:<br>• Copy tray<br>• Control key, door switch lever<br>• Silicone oil bottle<br>• Hopper stopper (4 pcs.)<br>• User's Manual<br>• Funnel for starter developer (4 pcs.)<br>• Waste toner case<br>• Size Label, duplexing unit label<br>• Silicone oil tank funnel cap<br>• Grounding wire |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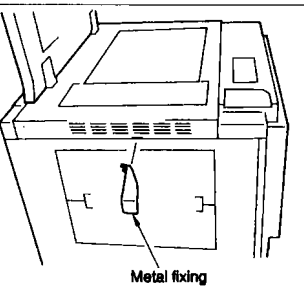
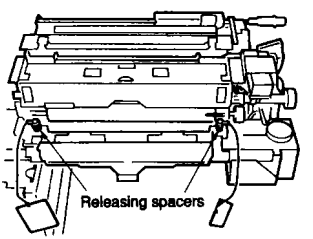
## B. Removing the Fixing Members and Installing the Waste Toner Case

| No. | Step | Remarks |
|---|---|---|
| 1 | Remove the packaging tape and protection tape from the copier. | |
| 2 | Removing the scanner metal fixing<br>Peel off the tape from the scanner metal fixing found on the outside of the left cover; then, slide the metal fixing from rear to front, and pull it to the left to remove. |  <br><br>Keep the metal fixing in the service document compartment found below the right door for use when relocating the machine. |
| 3 | Open the front door, and remove the tape from the lever and fixing members. | |
| 4 | Take out the fixing members and fixing tape from inside the cassette. | |
| 5 | Release the lever, and slide out the transfer frame. | |
| 6 | Pull out the two fixing roller releasing spacers. |  <br> |

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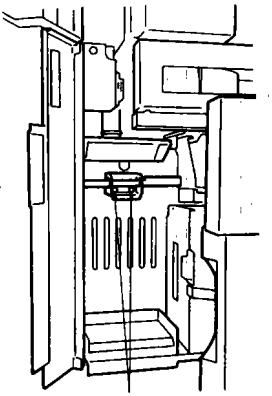
| No. | Step | Remarks |
|---|---|---|
| 7 | Slide out the cassette 2, duplexing unit, and cassettes 3 and 4 and open the lower cover, and remove the grip from the bottom left front (2 screws); then, set the waste toner case. |  <br>Screws<br><br>The grip found at the bottom left front will be used again when relocating the machine: store it away in the service document compartment found below the right door. |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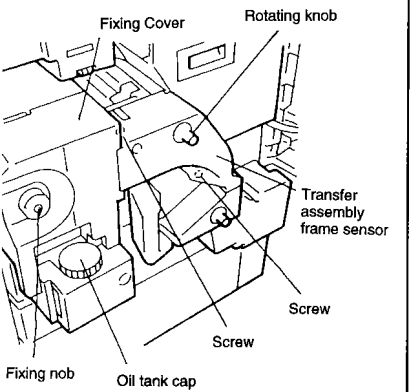
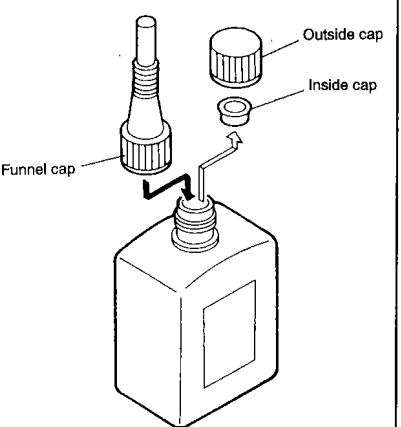
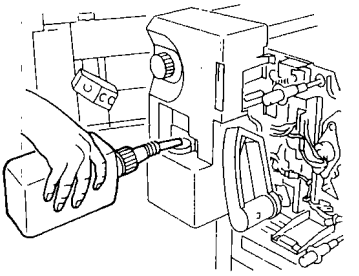
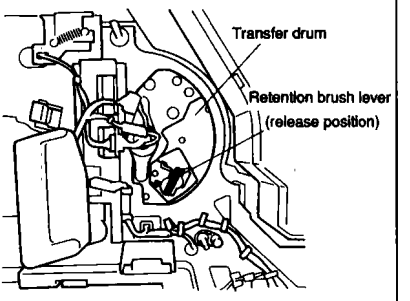
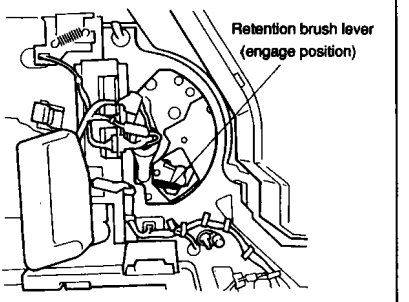
## C. Pouring the Fixing Oil

| No. | Step | Remarks |
|---|---|---|
| 1 | Remove the transfer drum rotating knob; then remove the transfer frame cover (2 screws), and remove the fixing member.<br>Remove the fixing assembly rotating knob (1 screw), then, remove the fixing cover (2 screws), and remove the packing from inside. |  |
| 2 | Remove the cap from the fixing oil tank. | |
| 3 | Remove the outside and inside caps of the fixing oil bottle, and fit the funnel cap that comes with the machine in their place. |  |

| No. | Step | Remarks |
|---|---|---|
| 4 | Pour all the fixing oil into the tank. |  |
| 5 | Fit the caps tothe fixing oil tank. | |
| 6 | Turn the gear of the transfer drum counterclockwise with a finger until the lever of the retention brush is in view.<br><br>**Caution:**<br>Turning the gear counterclockwise can generate a clicking sound because of the CCW rotation stop; this is normal, and you may ignore the sound.<br><br>Shift the lever of the retention brush to the left to engage the retention brush. |  <br>  |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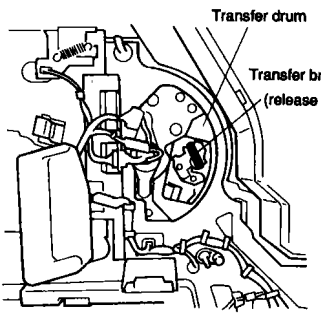
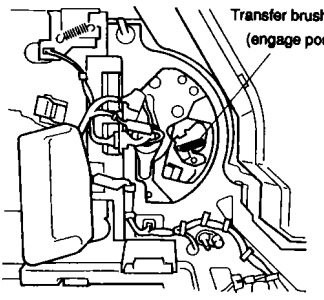
| No. | Step | Remarks |
|---|---|---|
| 7 | Turn the gear of the transfer drum with a finger until the lever of the transfer brush is in view.<br>Shift the lever of the transfer brush to the left to engage the transfer brush. |  <br>  |
| 8 | Install the cover and the rotating knob; then, push the transfer assembly into the machine. | |

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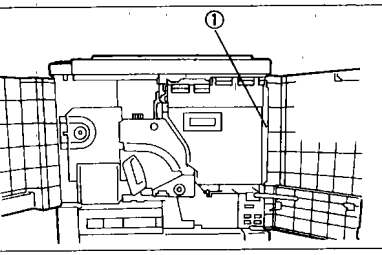
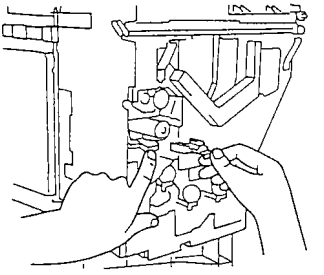
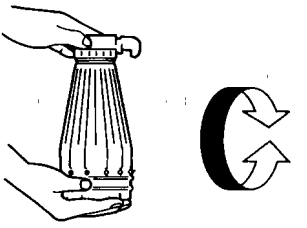
## D. Supplying Toner

| No. | Step | Remarks |
|---|---|---|
| 1 | Remove the screw from the stopper plate on the right door, and fully open the right door. Remove the slide stoppers of the hopper unit (2 screws). |   |
| 2 | While pushing the hopper stopper down, slide out the hopper unit, and rotate it. | |
| 3 | Place copy paper between the open hopper and the floor, and insert the hopper stopper (accessory) into the four supply mouths found at the bottom of the hopper (for each color). |  |
| 4 | Slowly agitate the Bk toner bottle at least 20 time as shown.<br>**Caution:**<br>Agitate the bottle just before setting it onto the hopper. Make sure that the toner has become loose and that there are no lumps. |  |

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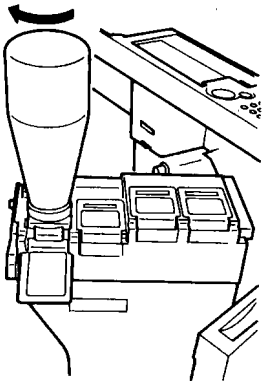
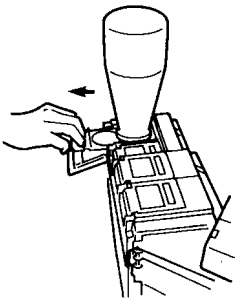
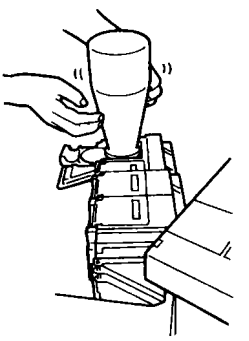
| No. | Step | Remarks |
|---|---|---|
| 5 | Open the lid of the Bk toner hopper, and attach the Bk toner bottle into the hopper; hold the base of the bottle, and turn the bottle about 10° to the right. |  |
| 6 | Open the slide shutter of the Bk toner bottle, and tap the bottle a couple of times on its bottom and side.<br>• Record when you have started supplying the toner.<br>Make sure that all of the toner has fallen into the hopper. |  <br>  |

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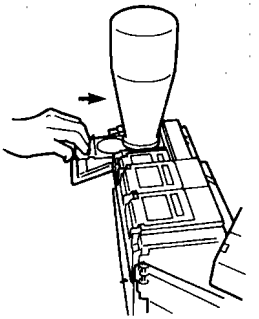
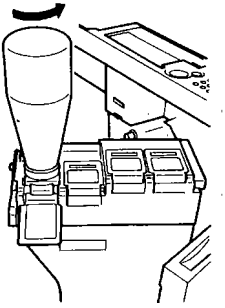
| No. | Step | Remarks |
|---|---|---|
| 7 | Close the slide shutter of the Bk toner bottle, and turn the bottle about 10° to the left to remove. Check to make sure that no toner remains on the mesh covering the toner inlet; if toner remains, tap lightly on the hopper assembly so that the toner will fall into the hopper. |   |
| 8 | Repeat the steps for the M, C, and Y toners. | |
| 9 | Perform the steps given under "E. Removing the Drum Cleaner" and "F. Supplying the Starter Developer." | |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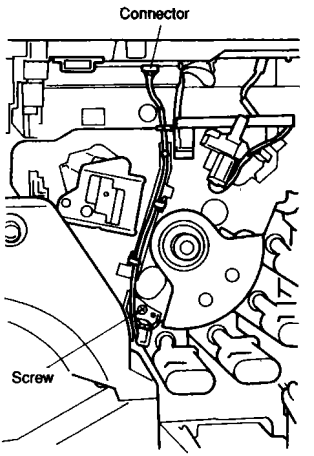
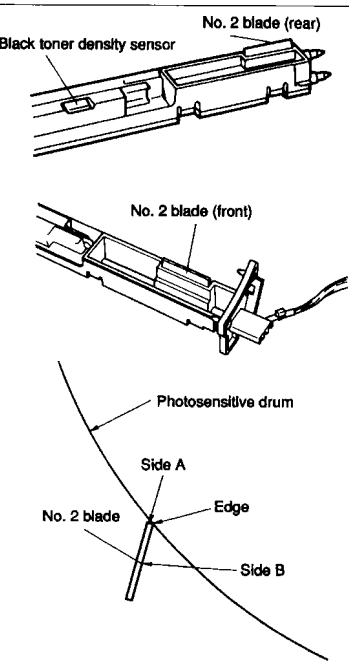
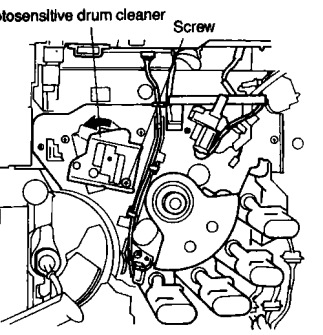
## E. Removing the Drum Cleaner

| No. | Step | Remarks |
|---|---|---|
| 1 | Disconnect the connector, free the harness from the edge saddle, and pull out the black toner density sensor (1 screw); be sure to pull the unit straight out. |  |
| 2 | Apply drum cleaner lubricant evenly on the No. 2 blade (front, rear).<br>• Shake the drum cleaner lubricant well before application.<br>• Be sure to apply the lubricant on sides A and B as well as the edge.<br>• Do not rub in the lubricant, or you may chip the edge; instead, tap it lightly onto the blade. |  |

| No. | Step | Remarks |
|---|---|---|
| 3 | Dry wipe the sensor face of the black toner density sensor.<br>• Do not use alcohol. | |
| 4 | After attaching the black toner density sensor, connect the connector (1 screw).<br>• Take care not to touch the photosensitive drum. | Bringing the No.2 blade into contact with the photosensitive drum will let the lubricant stick to the photosensitive drum, possibly leading to transfer faults (white spots) |
| 5 | Remove the screw, and shift the photosensitive drum cleaner to the left; then, slide out the photosensitive drum cleaner. |  |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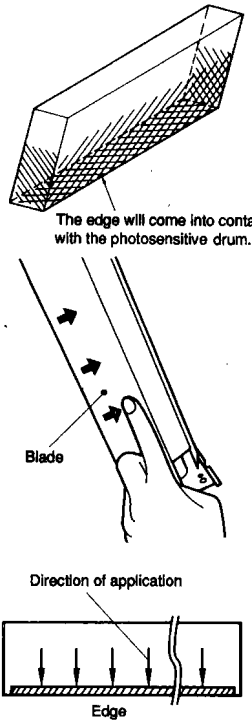
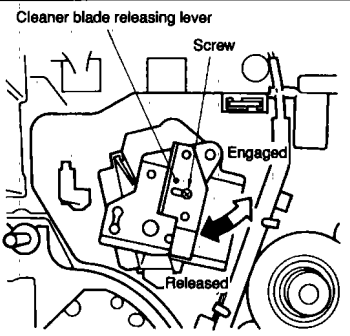
| No. | Step | Remarks |
|---|---|---|
| 6 | Apply drum cleaner lubricant evenly on the blade of the photosensitive drum cleaner; use lint-free paper around your finger.<br>• Uneven application can cause white vertical lines on copies.<br>• Be sure to apply to all surfaces in addition to the edge, except the lower surface.<br>• Do not rub in the lubricant, or you may chip the edge; instead, tap lightly.<br>• Start from the top toward the edge surface as if to orient the lubricant where it will come into contact with the drum. |  |
| 7 | Attach the photosensitive drum cleaner (1 screw).<br>• Take care not to touch the photosensitive drum. | |

| No. | Step | Remarks |
|---|---|---|
| 8 | Loosen the screw to engage the cleaner releasing lever; fix the screw in place. (The blade is engaged when the lever is as shown in the diagram).<br><br>**Caution:**<br>You must make sure that the screw is securely in place; otherwise, the cleaning assembly may become damaged. |  |
| 9 | After drawing out the transfer assembly frame and attaching the transfer assembly frame cover (2 screws), attach the transfer drum rotating knob. | |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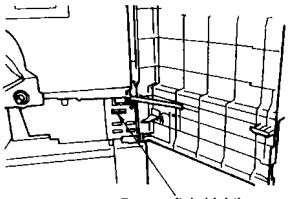
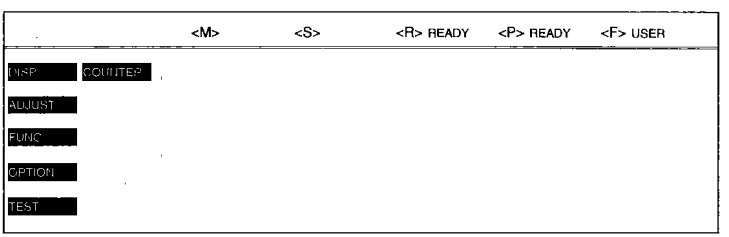
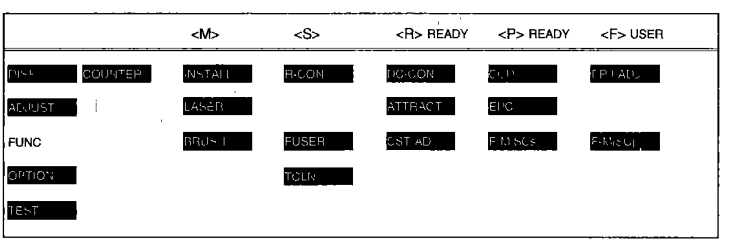
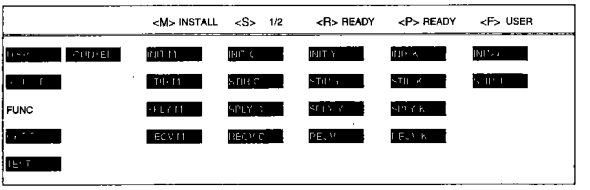
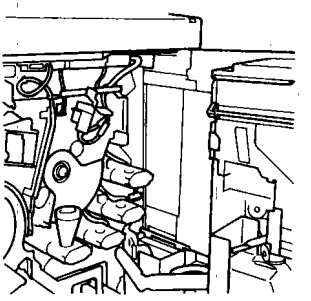
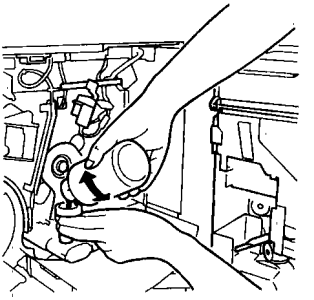
## F. Supplying the Starter Developer

| No. | Step | Remarks |
|---|---|---|
| 1 | Close the left door, and insert the door switch actuator into the door switch (right). |  Door switch (right) |
| 2 | Insert the control key | |
| 3 | Connect the power plug, and turn on the power switch. | Make sure that the voltage is as rated, ±10%. |
| 4 | During the wait period, perform the following:<br>• Place paper in the cassettes.<br>• Attach the original tray (option). | |
| 5 | When the warm-up period is over, press *, [2], [8], and * to activate service mode. (Press keys [2] and [8] simultaneously.) | |
| 6 | Press 'FUNC'.<br>  | |
| 7 | Press 'INSTALL'.<br>  | |

| No. | Step | Remarks |
|---|---|---|
| 8 | Press 'SPLY-K'.<br>  <br><br>Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'SPLY-K' in service mode. | |
| 9 | The Bk developing assembly will become engaged, and the feeding screw inside the developing assembly will start to rotate. | |
| 10 | Attach the starter developer supply funnel that comes with the copier (not with the starter developer) to the supply mouth of the Bk developing assembly. |  <br>• Perform for one color only.<br>• Do not use the supply funnel that comes with the starter developer; its mouth is too small. |
| 11 | Pour the starter developer into the developing assembly.<br>• Try slanting the bottle gradually while turning it to avoid spilling the starter developer. |  |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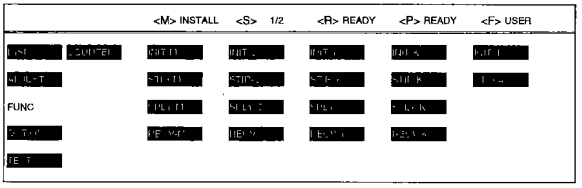
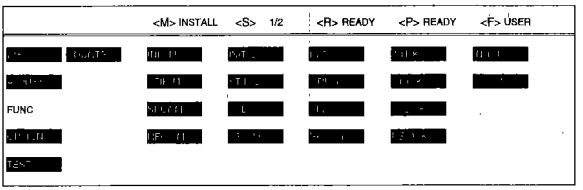
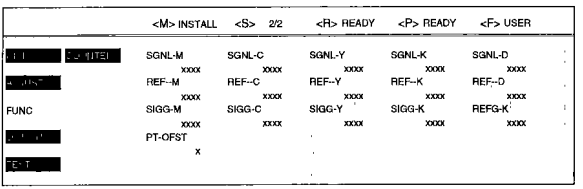
| No. | Step | Remarks |
|---|---|---|
| 12 | When all starter developer has poured into the developing assembly, press the Stop key to stop operation. | |
| 13 | Repeat steps 9, 10, 11, 12, 13, and 14 for M, C, and Y toners. (Press 'SPLY-M', 'SPLY-C', or 'SPLY-Y' according to the color of the toner.) | |
| 14 | When all developing assemblies have been supplied with their respective toners, wait 10 min. or more; and then remove the toner hopper stoppers.<br>**Caution:**<br>Be sure to pull the hopper stopper horizontally; pulling it at an angle will damage the sealing, whose chips may fall into the developing assembly. | |
| 15 | Open the left door, turn the hopper unit slowly, and place the spacer on the left of the hopper on the rail while pushing the hopper stopper. | |
| 16 | Push in the hopper unit carefully until it reaches the locking position at the rear.<br>**Caution:**<br>Exercise care; rough handling can cause large amounts of toner to fall from the toner hopper assembly. | |
| 17 | Press 'STIR-4', and wait until stirring stops (about 10 min).<br>  <br><br>Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'STIR-4' in service mode. | |

<table>
<tr><th>No.</th><th>Step</th><th>Remarks</th></tr>
<tr><td>18</td><td>Press 'INIT-4'. Wait until ATR is over; it will take about 5 min.<br> 
<br>Check to make sure that the machine has completed its wait-up period ('P' on the service mode display is 'READY') before executing 'INIT-4' in service mode.</td><td></td></tr>
<tr><td>19</td><td>Press 'INTERRUPT'.<br> 
<br>Caution:<br>Check to make sure that the wait-up period (<P> in service mode is 'READY') is over before executing 'INIT-4'.</td><td></td></tr>
<tr><td>20</td><td>Take notes of the value of 'SGNL-K' indicated when you executed ATR automatic adjustment in step 19.</td><td></td></tr>
<tr><td>21</td><td>Select 'DC-CON' under 'FUNC' of service mode, and enter a value obtained by adding '37' to the value being indicated for 'SGNL-K' into 'SGNL-K'.</td><td></td></tr>
<tr><td>22</td><td>Press 'SEND' at the lower right hand corner of the screen, and leave service mode; then, turn off and then on the power switch.</td><td></td></tr>
<tr><td>23</td><td>Record data related to ATR on the Service Data Sheet.<br>For 'SGNL-K', use the value you entered for a second time.</td><td>The Service Data Sheet is attached behind the DC controller PCB cover on the rear cover.</td></tr>
<tr><td>24</td><td>Press the Reset key twice, and remove the door switch actuator.</td><td></td></tr>
<tr><td>25</td><td>Attach the slide stopper of the hopper unit and the stopper tape on the right door (1 screw).</td><td></td></tr>
<tr><td>26</td><td>Close the front door.</td><td></td></tr>
</table>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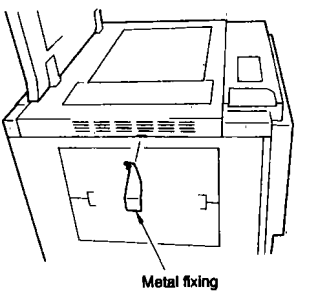
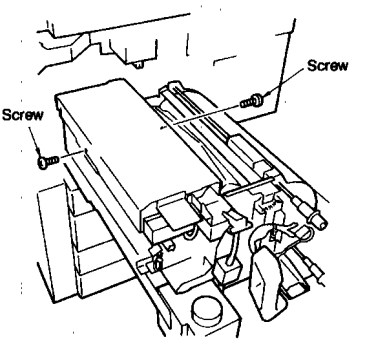
## G. Checking the Images/Operation

| No. | Step | Remarks |
|---|---|---|
| 1 | Remove the door switch actuator, and close the front door. | |
| 2 | Configure the cassette (size) to suit the needs of the user.<br>First, adjust the side guide plate to suit the paper size; then, put copy paper in the cassette, and adjust the rear end guide plate to the trailing edge of the paper. | |
| 3 | Remove the cassette size plate from each cassette holder, and attach the appropriate size label to each plate.<br>Put the size plates back into position. | |
| 4 | Set the cassettes into the copier. | • Make sure that the 'ADD PAPER' message goes off.<br>• Press the keys other than the Copy Start key on the control panel to make sure that the operations are normal. |
| 5 | Set the Test Sheet on the copyboard, and check the images on its copies made using all cassettes. | • Make sure that there is no abnormal sound.<br>• Check the copy image for each default reproduction ratio.<br>• Make sure the copies are made as many as specified.<br>• If the copy image is not normal, perform the Image Adjustment Basic Procedure. |
| 6 | Select 'PASCAL' under 'ADJUST' in service mode; then, make sure that PASCAL is '1'; otherwise, set it to '1'. | |
| 7 | Press the Reset key to leave service mode. | |
| 8 | Make copies in manual mode. | • Make sure that the copies are made normally. |
| 9 | Check that all external covers are free of scratches and deformations. | |
| 10 | Clean up the area around the copier. | |
| 11 | Put the copier back into its original position. | • Make sure that the copier is more or less level. |
| 12 | Fill out the Service Sheet with necessary information. | |

Install the options as necessary only after completing the above steps.

# III. RELOCATING THE MACHINE

Go through the following steps before moving the machine by truck or other means of transportation after it has been installed.

| No. | Step | Remarks |
|---|---|---|
| 1 | Tape the lid of the toner hopper in place. | |
| 2 | Attaching the Scanner Metal Fixing<br>Put the metal fixing to the hole of the delivery assembly, and fix the scanner mirror mount by sliding it from the front to the rear. |  |
| 3 | Slide out the transfer assembly frame. | |
| 4 | Attach the fixing members from below the transfer assembly frame for the transfer drum and transfer cleaner. | |
| 5 | Pull out the fixing assembly, and remove the fixing assembly cover.<br>(Place a newspaper or the like on the floor to avoid staining with fixing oil.) |  |

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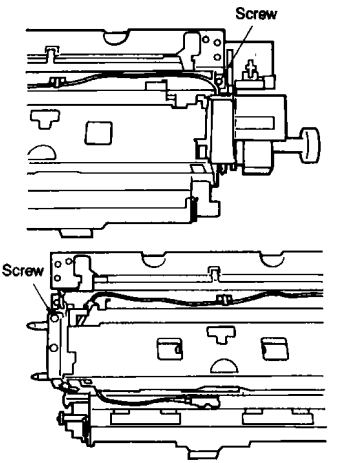
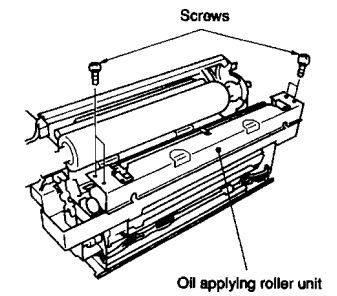
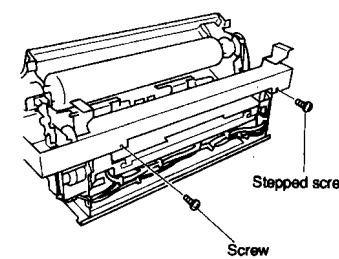
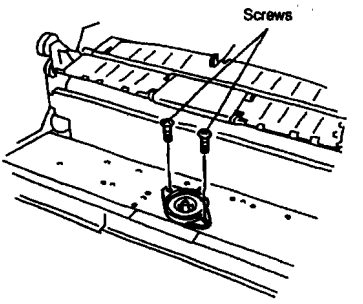
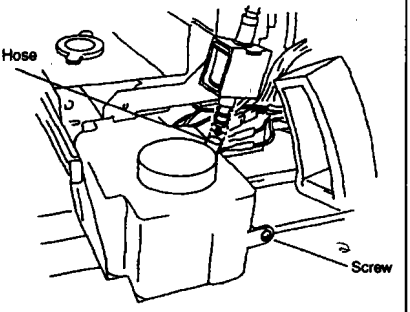
| No. | Step | Remarks |
|---|---|---|
| 6 | Remove the two screws, and open the upper fixing roller unit. |  |
| 7 | Remove the four screws, and remove the oil applying roller unit.<br>(Take care so that oil will not drip from the oil applying roller unit onto the floor.) |  |
| 8 | Remove the two screws, and remove the upper oil pan. (The rear is fixed with a stepped screw.)<br>Tilt the upper oil pan to pour the fixing oil into the oil case.<br>Attach the upper oil pan, oil applying roller unit, and upper fixing roller unit; then, push in the fixing assembly/transfer assembly frame unit into the copier. |  |

| No. | Step | Remarks |
|---|---|---|
| 9 | Remove the two screws, and remove the oil receptacle. |  |
| 10 | Detach the hose of the oil tank from the electromagnetic pump. |  |
| 11 | Remove the screw, and slide out the oil tank assembly toward the front; then, draw out the silicone oil from the oil tank.<br><br>**Reference:**<br>The filter in the pipe of the oil tank is used to prevent contamination by foreign matter; its location is not important as long as its is inside the pipe. | |
| 12 | Assemble the part in reverse order (steps 11, 10, 9). | |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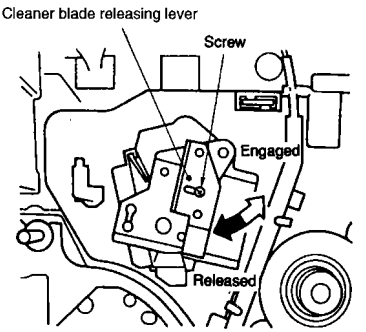
| No. | Step | Remarks |
|---|---|---|
| 13 | Loosen the screw, and shift the cleaning blade releasing lever slowly to release position; then, tighten the screw while holding the lever in place. |  |
| 14 | Tape the releasing lever of the transfer drum in place. | |
| 15 | Tape the front door, delivery assembly, and pick-up assembly in place. | |

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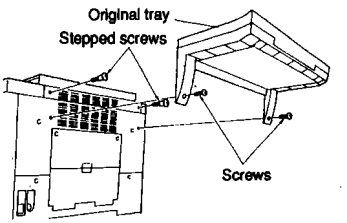
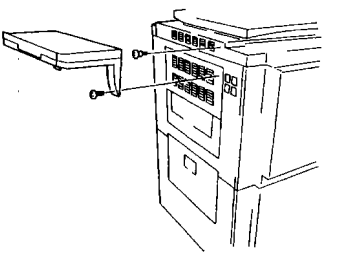
# IV. INSTALLING THE ORIGINAL TRAY

| No. | Step | Remarks |
|---|---|---|
| 1 | Peel off the face sticker from the copier, and fit two stepped screws to the left or right of the copier. | |
| 2 | Fit the original tray on the stepped screws, and fix the original tray with screws. |  <br>  |

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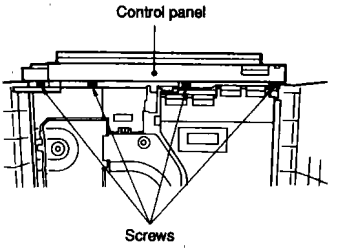
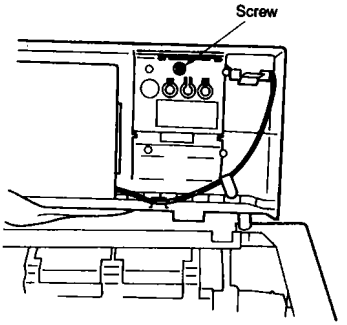
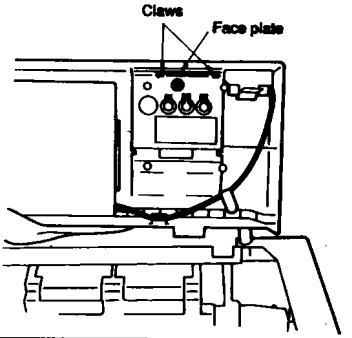
# V. INSTALLING THE CONTROL CARD-V

| No. | Step | Remarks |
|---|---|---|
| 1 | Open the copier's front door, and remove the four screws used to fix the control panel in place; then, turn over the control panel. |  |
| 2 | Remove the screw from the face plate. |  |
| 3 | Disengage the claws, and remove the face plate from the card slot. |  |
| 4 | Attach the insulating sheet to the opening for the CC-V's display on the control panel. | |
| 5 | Peel off the protective sheet attached to the display of the CC-V. | |

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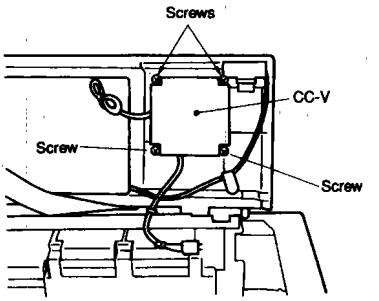
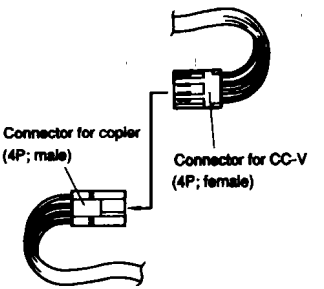
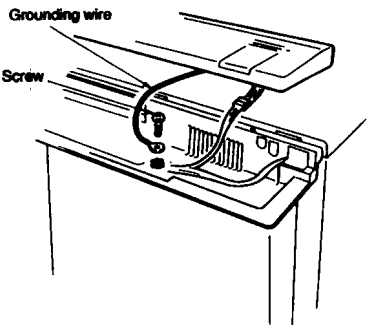
| No. | Step | Remarks |
|---|---|---|
| 6 | Fix the CC-V to the control panel using four self-tapping screws.<br>At this time, insert a card into the CC-V; and fix the CC-V at a point where insertion and removal of the card is smooth.<br>In addition, check to make sure that the connector for the printer is centered in the hole. |  |
| 7 | Disconnect the shorting connector, and connect the connector (4P) of the CC-V in its place.<br>(The connector for the copier is found under the control panel.) |  |
| 8 | Fix the grounding wire of the CC-V using the screw attached to the bottom of the copier's control panel. |  |
| 9 | Peel off the protective sheet from the control panel nameplate of the CC-V. | |
| 10 | Attach the control panel nameplate of the CC-V to the copier's control panel. | |
| 11 | Attach the control panel to the copier. | |
| 12 | Turn on the copier's power switch, and check the operation of the CC-V. | |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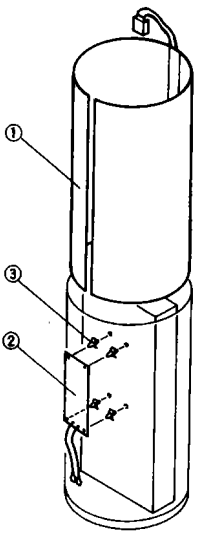
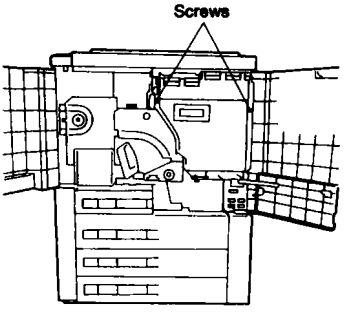
# VI. INSTALLING THE DRUM HEATER

| No. | Step | Remarks |
|---|---|---|
| 1 | Open the carton and check that the units shown below are available.<br><br>① Drum heater ..... 1 unit<br>② Heater controller PCB ..... 1 pc.<br>③ Locking support ..... 4 pcs. |  |
| 2 | Turn off the power switch, and disconnect the power plug. | |
| 3 | Open the front doors (left, right), and remove the screws to detach the hopper unit stoppers. |  |

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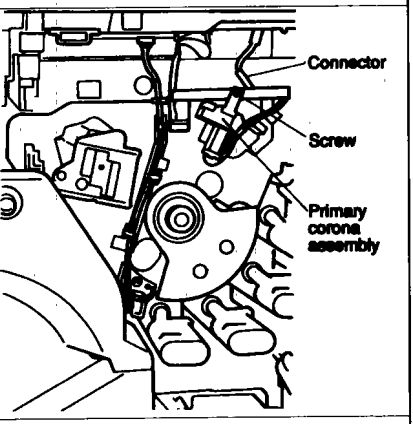
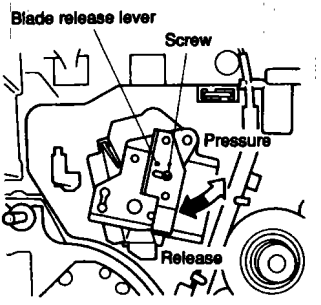
| No. | Step | Remarks |
|---|---|---|
| 4 | Open the hopper unit fully.<br>Thereafter, disconnect the connector of the primary corona assembly, and remove the screw; then, draw out the primary corona assembly. |  |
| 5 | Remove the transfer drum knob; then, remove the transfer assembly frame cover. | |
| 6 | Loosen the screw, and shift the cleaning blade releasing lever slowly to release position; then, tighten the screw while holding the lever in place. |  |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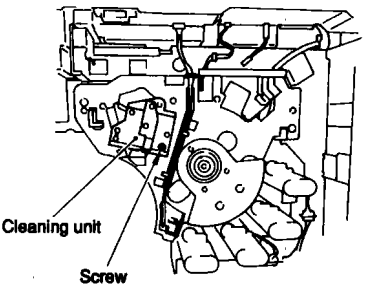
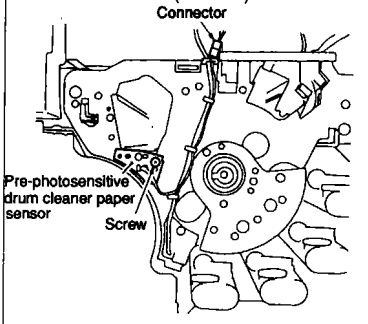
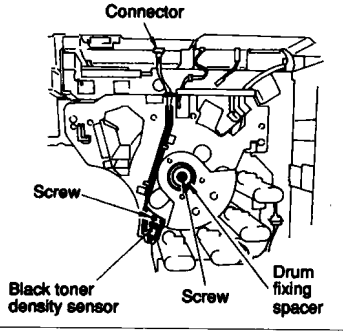
| No. | Step | Remarks |
|---|---|---|
| 7 | Remove the screw, and detach the photosensitive drum cleaning unit.<br>Remove the screw, and disconnect the connector; then, remove the pre-photosensitive drum cleaner paper sensor. (for future; TYPE 2 only) |  <br>(TYPE 1)<br>  <br>(TYPE 2) |
| 8 | Disconnect the connector for the black toner density sensor, and remove the screw to detach the black toner density sensor. |  |
| 9 | Remove the screw to detach the photosensitive drum fixing spacer. | |

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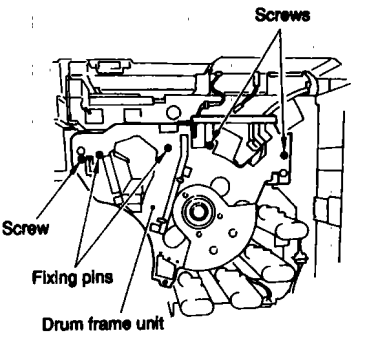
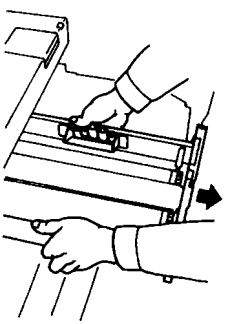
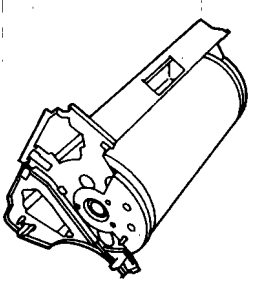
| No. | Step | Remarks |
|---|---|---|
| 10 | Remove the three screws, and loosen the two fixing pins; then, pull out the photosensitive drum frame unit.<br><br>**Caution:**<br>① Make sure that the transfer unit is properly seated.<br>② When pulling out the photosensitive drum, take extra care so as to avoid damage to the drum. |  <br>  |
| 11 | Hold the grips, and place the photosensitive drum frame unit as shown. |  |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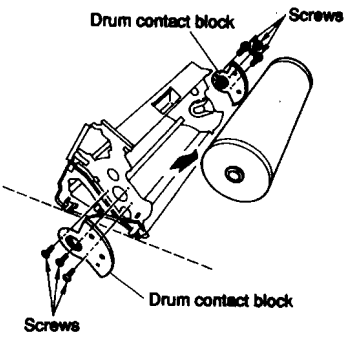
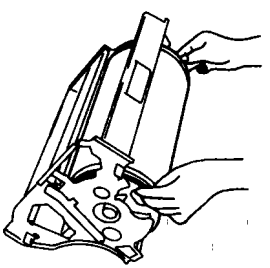
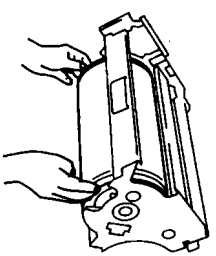
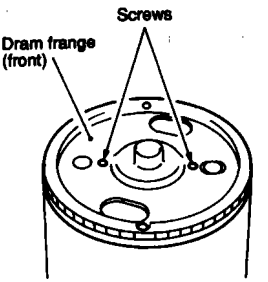
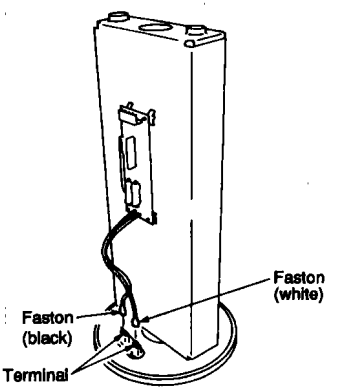
| No. | Step | Remarks |
|---|---|---|
| 12 | Remove the six screws, and detach the pho-tosensitive drum contact block (front, rear) |  |
| 13 | Pull out the photosensitive drum unit carefully.<br>**Reference:**<br>Put the hands as shown to facilitate remov-ing the pho-tosensitive drum.<br>**Caution:**<br>⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it. |  <br>  |

| No. | Step | Remarks |
|---|---|---|
| 14 | Place the photosensitive drum so that the drum heater friction plate of the photosensitive drum unit is at the bottom. |  |
| 15 | Remove the two screws, and remove the drum flange (front); then, remove the photosensitive drum.<br>**Caution:**<br>Be sure to keep the photosensitive drum in a dark place, thereby protecting it from light. | |
| 16 | Attach the locking support and the drum heater controller PCB to the drum flange connecting plate. | |
| 17 | Insert the two fastons of the drum heater controller PCB into the terminal found on the drum flange (rear). |  |
| 18 | Attach the photosensitive drum. | |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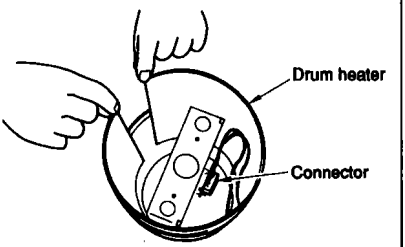
| No. | Step | Remarks |
|---|---|---|
| 19 | Insert the drum heater, and connect the connector of the drum heater controller PCB. |  |
| 20 | Attach the drum flange (front). | |
| 21 | Put the photosensitive drum into the photosensitive drum frame unit; then, attach the contact block detached in step 12).<br>**Caution:**<br>⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it. | |
| 22 | Put the photosensitive drum frame unit into the copier; then, attach the photosensitive drum fixing spacer, and fix it in position using the screw removed in step 9).<br>**Caution:**<br>⚠ Put the photosensitive drum into the photosensitive drum frame unit while taking care not to damage it. | |
| 23 | Attach the photosensitive cleaning unit and the black toner density sensor and the primary corona assembly; then, shift the cleaning blade releasing lever into locking position. | |
| 24 | After attaching the transfer drum knob and the transfer assembly frame cover, close the hopper; then, attach the hopper unit stopper, and close the front door.<br>**Caution:**<br>⚠ Be sure to use the white faston on the outside electrode; use the black faston on the inside electrode. | |

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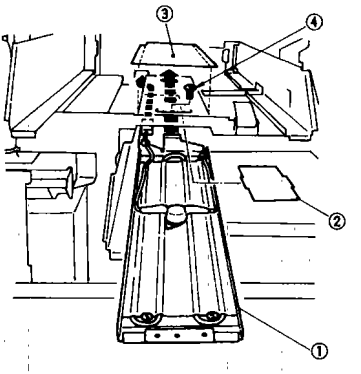
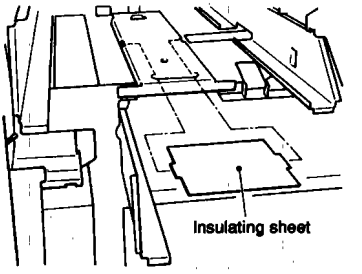
# VII. INSTALLING THE CASSETTE HEATER (CLC700)

| No. | Step | Remarks |
|---|---|---|
| 1 | Open the carton and check that the items shown below are available.<br><br>① Cassette heater ..... 1 unit<br>② Insulating sheet ..... 1 pc.<br>③ Insulating sheet ..... 1 pc.<br>④ Screw ..... 1 pc. |  |
| 2 | Disconnect the power cord from the electrical outlet. | |
| 3 | Slide out the cassette 1 and the cassette 2. | |
| 4 | Remove the five screws, and detach the rear cover. | |
| 5 | Remove the screw, and open the DC controller PCB. | |
| 6 | Attach the insulating sheet along the stay of the cassette 1. |  |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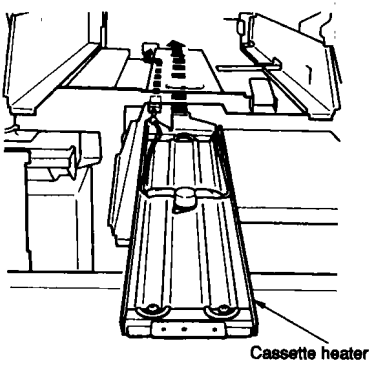
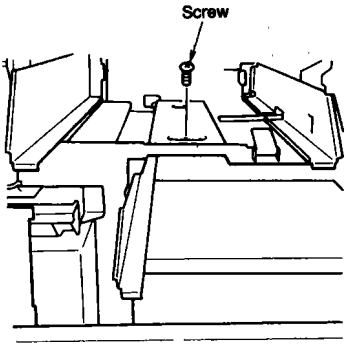
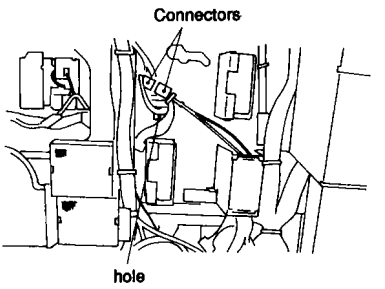
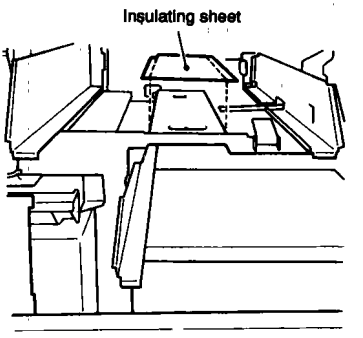
| No. | Step | Remarks |
|---|---|---|
| 7 | Insert the cassette heater into the hole at the rear of the stay in the cassette 1.<br>At this time, be sure to lead the connector of the cassette heater through the hole in the copier's rear side plate. |  |
| 8 | Fix the cassette heater in place on the stay in the cassette1 using a screw. |  |
| 9 | Connect the connector of the cassette heater. |  |

| No. | Step | Remarks |
|---|---|---|
| 10 | Attach the insulating sheet to the stay of the cassette 1. |  |
| 11 | After closing the DC controller PCB and attaching the rear cover, slide in the cassette 1 and the cassette 2. | |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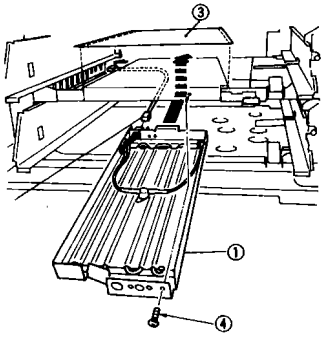
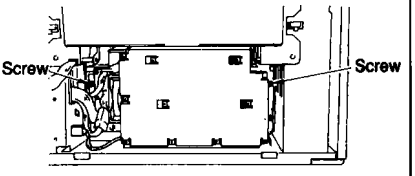
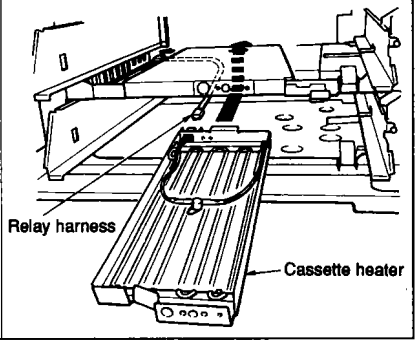
# VIII. INSTALLING THE CASSETTE HEATER (CLC800)

| No. | Step | Remarks |
|---|---|---|
| 1 | Open the carton, and check that the items shown below are available.<br><br>① Cassette heater ..... 1 unit<br>② Relay harness ..... 1 pc.<br>③ Insulating sheet ..... 1 pc.<br>④ Screw ..... 1 pc.<br>⑤ Cable clamp ..... 1 pc.<br>⑥ Edge saddle (largbe, small) ..... 1 pc. each |  |
| 2 | Disconnect the power cord from the electrical outlet. | |
| 3 | Slide out the cassettes 3 and 4. | |
| 4 | Remove the five screws, and detach the rear cover. | |
| 5 | Remove the two screws, and detach the left cover; then, remove the two screws, and pull out the power supply unit. |  |
| 6 | Connect the relay harness to the cassette heater, and insert the cassette heater into the hole at the rear of the stay in the cassette 3. At this time, be sure to lead the connector of the cassette heater through the hole in the copier's left side plate. |  |

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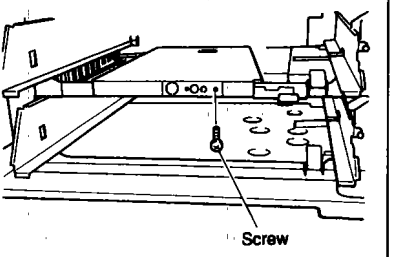
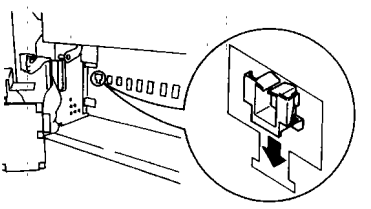
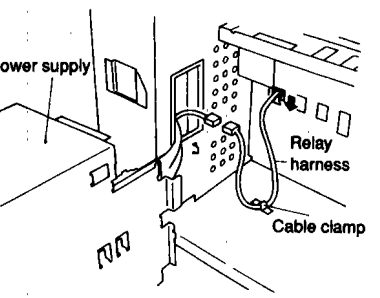
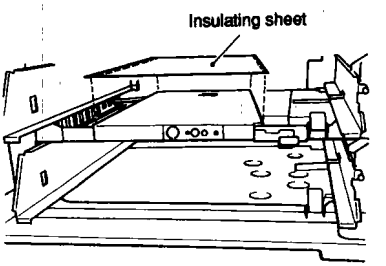
| No. | Step | Remarks |
|---|---|---|
| 7 | Fix the cassette heater to the stay of the cassette using a screw from the copier's front |  |
| 8 | Attach the edge saddle (large or small) as shown; select the saddle to suit the shape of the hole in the left side plate. |  |
| 9 | Connect the connector of the cassette heater. |  |
| 10 | Attach the insulating sheet to the stay of the cassette. |  |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| No. | Step | Remarks |
|---|---|---|
| 11 | Attach the power unit and the left cover. | |
| 12 | Attach the rear cover; then, slide in the cassettes. | |

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# I. PERIODICALLY REPLACED PARTS

As of Aug 1, 1996

| No. | Parts name | Parts No. | Q'ty | Life (copies) | Remarks |
|---|---|---|---|---|---|
| 1 | Air filter (FM1) | FB2-0247-000 | 1 | 20,000 | Or, 1yr. |
| 2 | Air filter (FM2) | FA6-0731-000 | 1 | 20,000 | Or, 1yr. |
| 3 | Air filter (FM4) | FB2-4383-000 | 1 | 20,000 | Or, 1yr. |
| 4 | Air filter (FM5) | FB2-0247-000 | 1 | 20,000 | Or, 1yr. |
| 5 | Air filter (FM13) | FB2-4383-000 | 1 | 20,000 | Or, 1yr. |
| 6 | Ozone filter (FM4) | FB2-4396-000 | 1 | 40,000 | Or, 1yr. |
| 7 | Ozone filter (FM3) | FB2-4397-000 | 1 | 40,000 | Or, 1yr. |
| 8 | Ozone filter (FM13) | FB2-4396-000 | 1 | 40,000 | Or, 1yr. |

**Note:**
The above values are estimates only and are subject to change based on future data.
The parts numbers may be updated to reflect the latest design revisions.

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# II. DURABLES AND CONSUMABLES

As of Aug 1, 1996

| No. | Part name | Parts No. | Q'ty | Life | Remarks |
|---|---|---|---|---|---|
| 1 | Waste toner case | FY9-7006-000 | 1 | 20,000 | Replaced by user |
| 2 | Cleaning blade (photosensitive drum cleaner) | FB2-0350-000 | 1 | 20,000 | |
| 3 | Blade side seal (photosensitive drum cleaner) | FF5-2248-000 | 1 | 20,000 | Edge felt (front) |
| 4 | | FF5-2249-000 | 1 | 20,000 | End felt (rear) |
| 5 | Scoop-up sheet (photosensitive drum cleaner) | FF5-3993-000 | 1 | 20,000 | |
| 6 | Scoop-up sheet side sticker (photosensitive drum cleaner) | FF5-2246-000 | 1 | 20,000 | End plastic sponge (front) |
| 7 | | FF5-2247-000 | 1 | 20,000 | End plastic sponge (rear) |
| 8 | Scanning lamp | FH7-3264-000 | 1 | 20,000 | |
| 9 | Primary corona wire cleaning pad | FF2-3551-000 | 1 | 20,000 | Upper; for low-humidity environment, 10,000 |
| 10 | | FF2-3552-000 | 1 | 20,000 | Lower; for low-humidity environment, 10,000 |
| 11 | Curl pressing sheet (duplexing unit) | FB2-6250-000 | 8 | 20,000 | Two-sided copy counter reading |
| 12 | Fixing oil | FG5-3918-000 | 1 | 20,000 | 1.4L per supply 14K/1.0L |
| 13 | Multifeeder separation arm (separation pad) | FF5-2288-000 | 1 | 30,000 | |
| 14 | Charging wire (primary, separation, internal and external static eliminating) | FY3-0040-000 | AR | 40,000 | 115/220/240 V; for low-humidity environment, 20,000 |
| 15 | Grid wire (primary) | Y81-0162-000 | 1 | 40,000 | For low-humidity environment, 20,000 |


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| No. | Parts name | Parts No. | Q'ty | Life | Remarks |
|---|---|---|---|---|---|
| 16 | No. 2 cleaner blade (photosensitive drum) | FB2-0421-000 | 2 | 40,000 | Both edges (20,000/edge) |
| 17 | Starter developer (Bk) | F42-0402-000 | 1 | 40,000 | |
| 18 | Starter developer (C) | F42-0412-000 | 1 | 40,000 | |
| 19 | Starter developer (M) | F42-0422-000 | 1 | 40,000 | |
| 20 | Starter developer (Y) | F42-0423-000 | 1 | 40,000 | |
| 21 | Retention brush unit | FG5-5841-000 | 1 | 40,000 | |
| 22 | Transfer brush unit | FG5-5842-000 | 1 | 40,000 | |
| 23 | Transfer cleaner brush | FA4-8874-000 | 1 | 40,000 | |
| 24 | Oil removing roller (transfer drum assembly) | FB2-0661-000 | 1 | 40,000 | Two-sided copy counter reading |
| 25 | Polishing roller (transfer drum assembly) | FB2-0587-000 | 1 | 40,000 | |
| 26 | Lower fixing roller | FB2-1084-000 | 1 | 40,000 | Or, in 1 yr. After installation. |
| 27 | Upper fixing roller | FB2-1080-000 | 1 | 60,000 | |
| 28 | Transfer drum sheet | FB2-0525-000 | 1 | 60,000 | |
| 29 | Oil applying roller (fixing assembly) | FB2-1143-000 | 1 | 60,000 | |
| 30 | Cleaning belt (fixing assembly) | FB2-3482-000 | 1 | 60,000 | |
| 31 | Multifeeder pick-up roller | FF5-2287-000 | 1 | 60,000 | |
| 32 | Scraper (1) | FF5-2170-000 | 2 | 60,000 | TYPE1 |
| | | FF5-4010-000 | 2 | 60,000 | TYPE2 |
| 33 | Oil applying blade (fixing assembly) | FB2-6305-030 | 1 | 100,000 | |
| 34 | Oil removing blade (fixing assembly) | FB3-2047-000 | 1 | 100,000 | Use one edge only |

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| No. | Parts name | Parts No. | Q'ty | Life | Remarks | |
|---|---|---|---|---|---|---|
| 35 | Fixing heater (lower; fixing assembly) | FH7-4409-000 | 1 | 100,000 | 115V | Or, 1yr. after installation. |
| 36 | | FH7-4410-000 | 1 | 100,000 | 220V/240V | |
| 37 | Fixing heater (lower; fixing assembly) | FH7-4409-000 | 1 | 100,000 | 115V | Or, 1yr. after installation. |
| 38 | | FH7-4410-000 | 1 | 100,000 | 220V/240V | |
| 39 | Pick-up roller (duplexing unit) | FF5-2101-000 | 1 | 100,000 | Two-sided copy counter reading (front) | |
| 40 | | FF5-2102-000 | 1 | 100,000 | Two-sided copy counter reading (rear) | |
| 41 | Feeding roller 1 (duplexing unit) | FF5-2103-000 | 1 | 100,000 | Two-sided copy counter reading | |
| 42 | Separation roller (duplexing unit) | FF5-2104-000 | 1 | 100,000 | Two-sided copy counter reading | |
| 43 | Feeding roller (duplexing unit) | FF5-2101-000 | 1 | 100,000 | Two-sided counter reading (front) | |
| 44 | | FF5-2102-000 | 1 | 100,000 | Two-sided counter reading (rear) | |
| 45 | Feeding roller (duplexing unit) | FF5-2274-000 | 2 | 100,000 | Two-sided counter reading | |
| 46 | Scraper (2) | FF5-2171-000 | 1 | 100,000 | | |
| 47 | Scraper (3) | FF5-2259-000 | 1 | 100,000 | | |
| 48 | Transfer cleaner motor (w/ mounting plate) | FG5-8298-000 | 1 | 100,000 | If the old type motor (FH6-1018) is installed, replace it together with the mounting plate with the indicated part (left). (Once done, the motor need not be replaced until the end of the machine life.) | |
| 49 | Cassette pick-up roller (pick-up assembly) | FF5-1220-000 | CLC700:2 CLC800:3 | 120,000 | Rear | |
| 50 | | FF5-1221-000 | CLC700:2 CLC800:3 | 120,000 | Front | |


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| No. | Parts name | Parts No. | Q'ty | Life | Remarks |
|---|---|---|---|---|---|
| 51 | Cassette feeding roller (pick-up assembly) | FB1-7061-000 | CLC700:4<br>CLC800:6 | 120,000 | |
| 52 | Cassette separation roller (pick-up assembly) | FB1-7060-000 | CLC700:4<br>CLC800:6 | 120,000 | |
| 53 | Pre-exposure lamp | FH7-3266-000 | 1 | 150,000 | |

**Note:**
The above values are estimates only and are subject to change based on future data.

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# III. PERIODICAL SERVICING CHART

**Caution:**
Do not use solvents or oils other than those mentioned.

△ : Clean ● : Replace x : Lubricate □ : Adjust ◎ : Inspect

As of Aug 1, 1996

| Unit | Parts | Servicing intervals | | | Remarks |
|---|---|---|---|---|---|
| | | every 20,000 | every 40,000 | every 60,000 | |
| Externals | Copyboard glass | △ | | | Alcohol |
| | Copyboard cover | △ | | | |
| | Ozone filter (3 locations) | ● | | | Or, 1 yr. |
| | Air filter (5 locations) | ● | | | Or, 1 yr. |
| | Retention roller spring clutch | X | | | Lubricant |
| | Spring clutch | | X | | |
| Pick-up feeding | Retention roller | △ | | | Remove the retention roller unit to clean. |
| | Retention roller cleaner | △ | | | |
| | Retention smoothing roller | △ | | | |
| | Retention smoothing roller cleaner | △ | | | |
| | Retention push-up roll | △ | | | Solvent |
| | Retention unit swing arm | △ | | | |
| | Pick-up/feeding/separation roller (pick-up assembly) | | △ | | |
| | Feeding belt | | △ | | Be sure to clean the back of the belt also. |
| Transfer drum | Transfer drum cleaner | △ | | | |
| | Oil removing roller | | ● | | Two-sided copy counter reading |
| | Polishing roller | | ● | | |
| | Transfer sheet scraper | | | △ | At time of replacing the transfer sheet. |
| | Transfer drum sheet | △ | | ● | Dry wipe. |


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△ : Clean ● : Replace x : Lubricate □ : Adjust ◎ : Inspect

| Unit | Parts | Servicing intervals | | | Remarks |
|---|---|---|---|---|---|
| | | every 20,000 | every 40,000 | every 60,000 | |
| Corona system | Corona wire (primary)* | △ | ● | | Dry wipe with lint-free paper; then, clean with alcohol. (Do not use water; make sure they are completely dry before attachment.) *If in a normal temperature and low-humidity environment, clean the corona wire for every 10,000 copies and replace it for every 20,000 copies by way of providing maintenance. |
| | Corona wire (separation)* | △ | ● | | |
| | Corona wire (external static eliminator)* | △ | ● | | |
| | Corona wire (internal static eliminator)* | △ | ● | | |
| | Retention smoothing brush | | ● | | |
| | Transfer brush | | ● | | |
| | Grid wire (primary) | △ | ● | | |
| | Shielding plate, block* | △ | | | |
| | Primary charging wire cleaning pad | ● | | | If in a low-humidity environment, replace for every 10,000 copies. |
| photosensitive drum | NO. 2 cleaning blade | △ | | | |
| | Black toner density sensor | △ | | | Dry wipe. |
| | Filter (pre-exposure lamp) | △ | | | Use blower brush. |
| | Photosensitive drum butting block | | △ | | Solvent At time of replacing the photosensitive drum. |
| | Pre-Photosensitive drum paper sensor | △ | | | Clean with a cotton wad. |
| Developing assembly | Photosensitive drum butting block | | △ | | Use solvent; at time of replacing drum. |
| Fixing assembly | Separation claw | △ | | | Use solvent. |
| | Inlet guide | △ | | | |
| | Outlet guide | △ | | | |
| | Blade (lower roller) | △ | | | Use lint-free paper. |
| | Blade (upper roller oil application) | △ | | | |
| | Thermistor | △ | | | Use lint-free paper. |

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△ : Clean ● : Replace x : Lubricate □ : Adjust ◎ : Inspect

| Unit | Part | Servicing intervals | | | Remarks |
|---|---|---|---|---|---|
| | | every 20,000 | every 40,000 | every 60,000 | |
| Scanning system | No. 1 through No. 3 mirrors | △ | | | Use blower brush. (Note 1) |
| | Reflector (scanning lamp) | △ | | | |
| | Scanner rail | △x | | | Clean with alcohol; then, apply lubricant. |
| Laser exposure system | Dust-proof glass | | | | Use lint-free paper as necessary. (Note 2) |
| Others | Hopper toner dish | △ | | | Dispose of the collection of toner. |

**Note 1:** Take care not to touch the mirrors and lenses; further, keep the CCD free of dust.
**Note 2:** Do not touch the laser mirror, and take care not to damage it.


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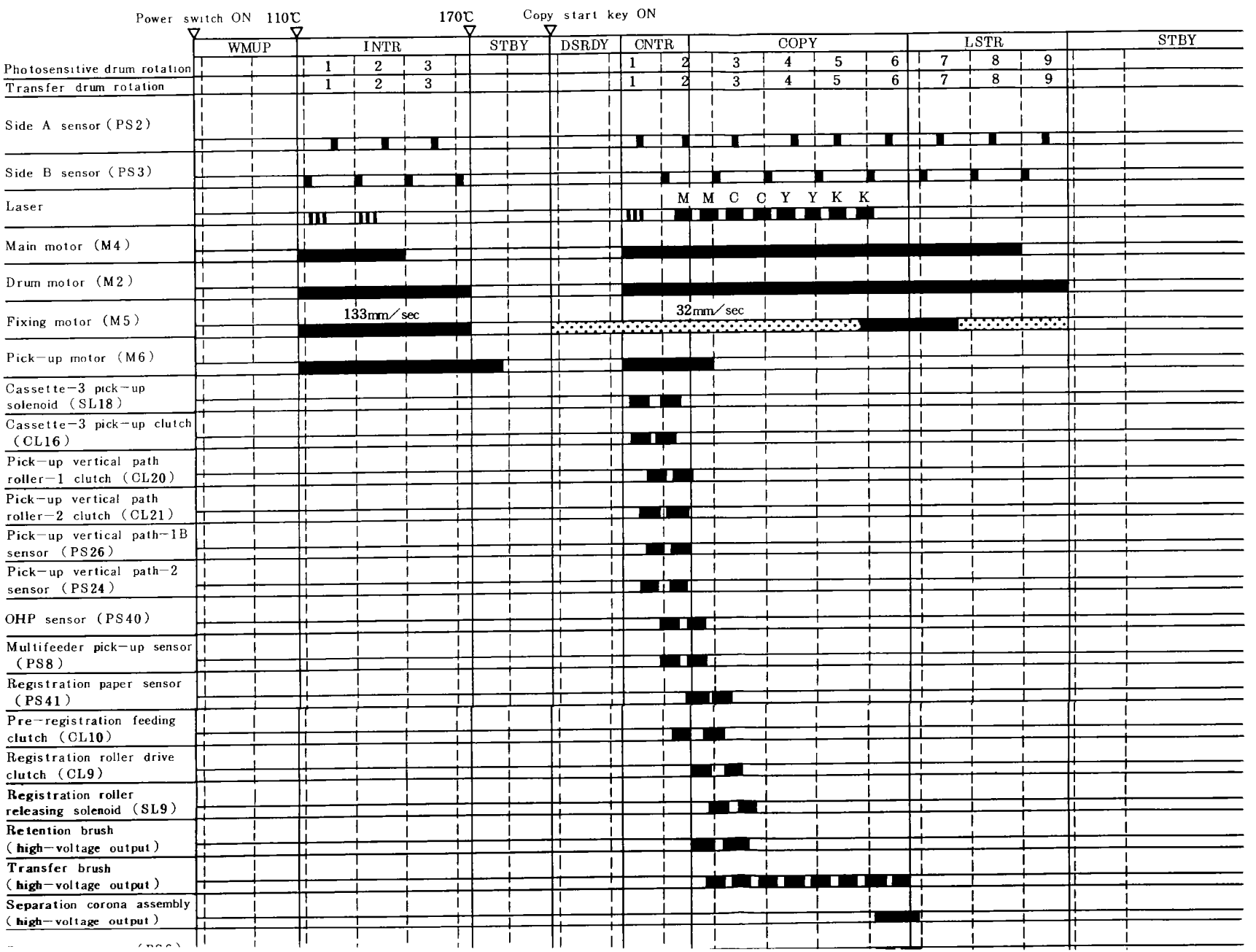
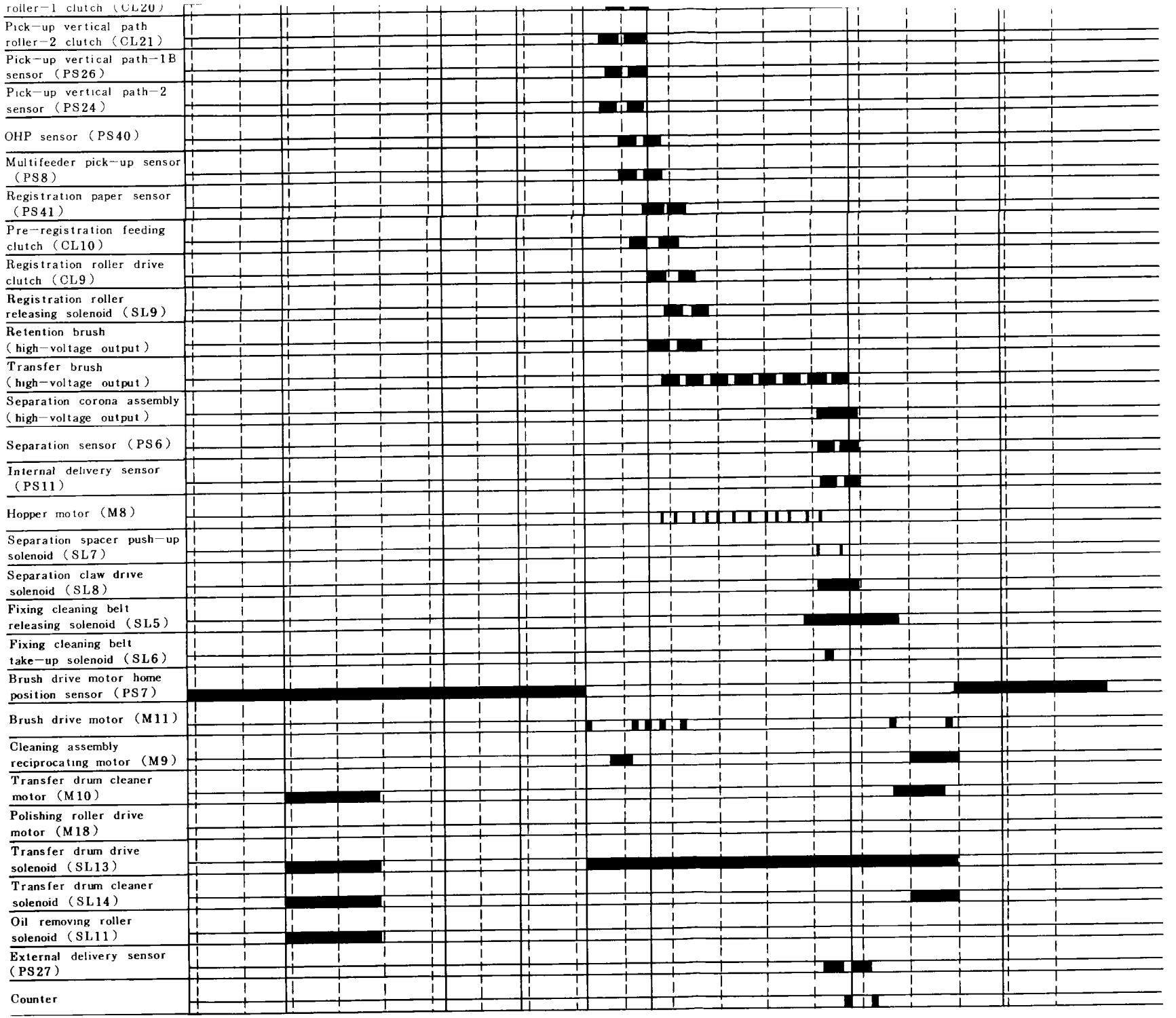
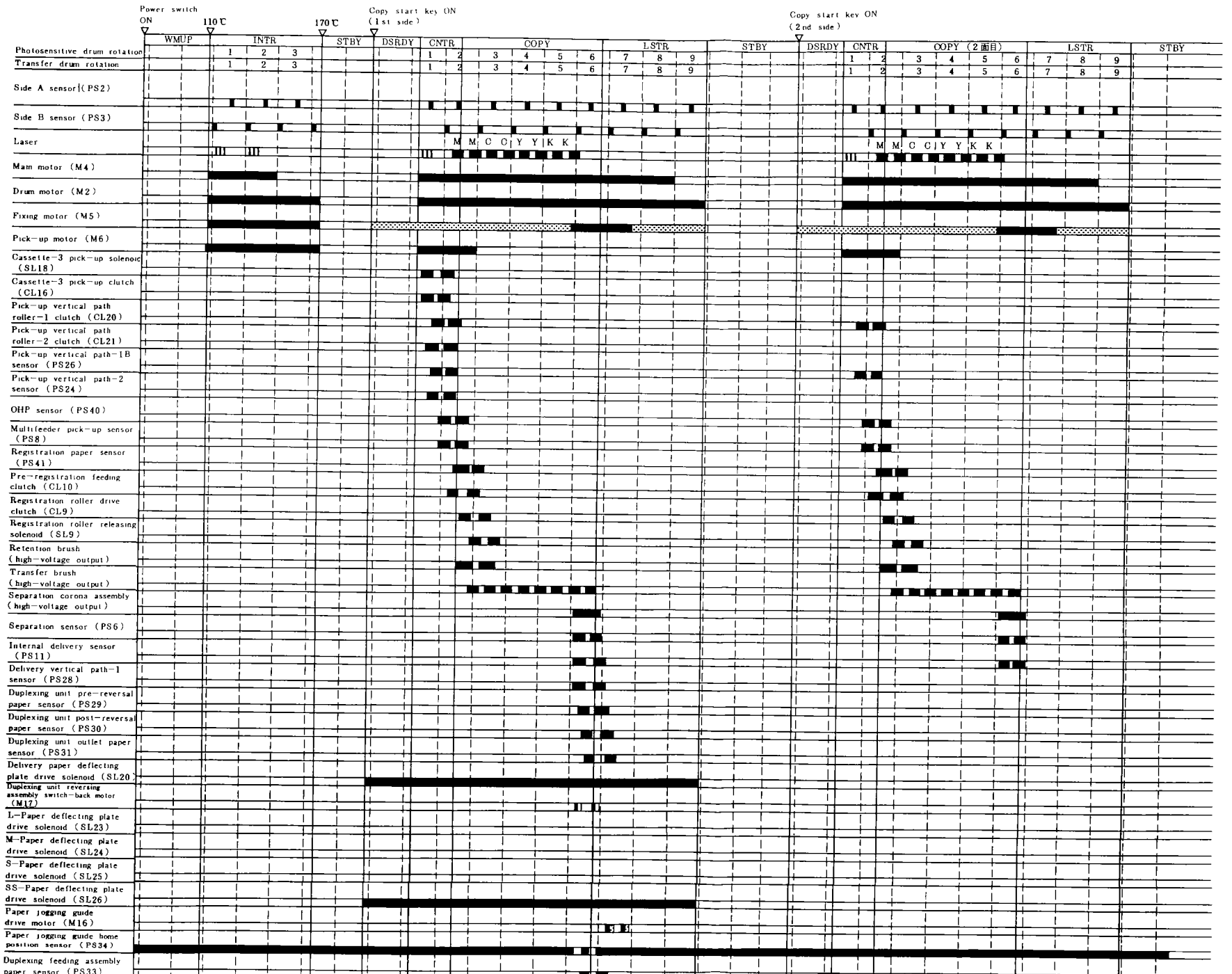
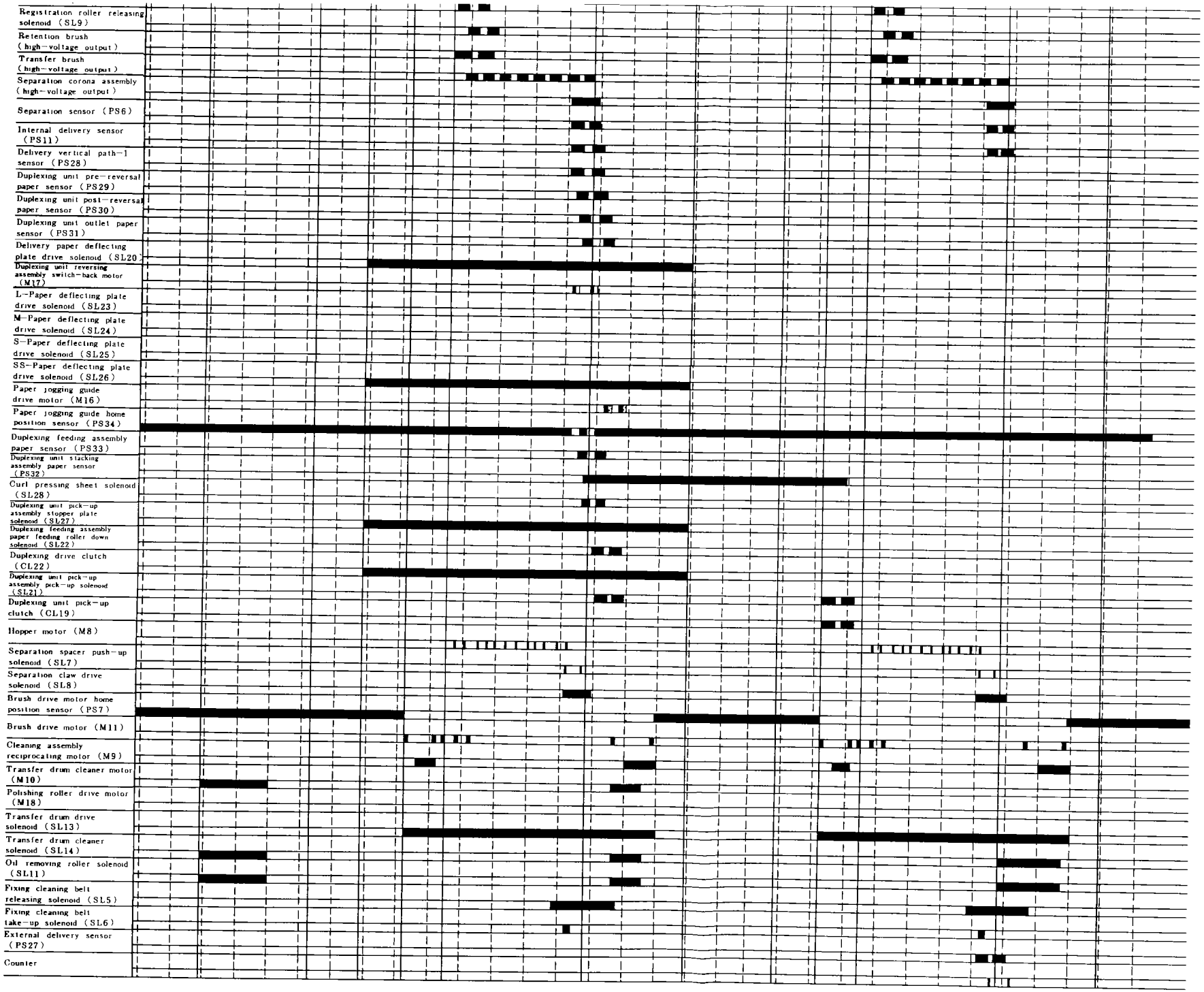
A4/Letter, 2 copies, 4 colors, DIRECT, one-sided, pick-up from cassette 3




roller−1 clutch (CL20)
Pick−up vertical path roller−2 clutch (CL21)
Pick−up vertical path−1B sensor (PS26)
Pick−up vertical path−2 sensor (PS24)
OHP sensor (PS40)
Multifeeder pick−up sensor (PS8)
Registration paper sensor (PS41)
Pre−registration feeding clutch (CL10)
Registration roller drive clutch (CL9)
Registration roller releasing solenoid (SL9)
Retention brush (high−voltage output)
Transfer brush (high−voltage output)
Separation corona assembly (high−voltage output)
Separation sensor (PS6)
Internal delivery sensor (PS11)
Hopper motor (M8)
Separation spacer push−up solenoid (SL7)
Separation claw drive solenoid (SL8)
Fixing cleaning belt releasing solenoid (SL5)
Fixing cleaning belt take−up solenoid (SL6)
Brush drive motor home position sensor (PS7)
Brush drive motor (M11)
Cleaning assembly reciprocating motor (M9)
Transfer drum cleaner motor (M10)
Polishing roller drive motor (M18)
Transfer drum drive solenoid (SL13)
Transfer drum cleaner solenoid (SL14)
Oil removing roller solenoid (SL11)
External delivery sensor (PS27)
Counter

A4 Letter, 2 copies, 4 colors, DIRECT, two-sided, pick-up from cassette 3


Power switch ON
110℃
170℃
Copy start key ON (1st side)
Copy start key ON (2nd side)
WMUP
INTR
STBY
DSRDY
CNTR
COPY
LSTR
COPY (2面目)
Photosensitive drum rotation
Transfer drum rotation
Side A sensor (PS2)
Side B sensor (PS3)
Laser
Main motor (M4)
Drum motor (M2)
Fixing motor (M5)
Pick-up motor (M6)
Cassette-3 pick-up solenoid (SL18)
Cassette-3 pick-up clutch (CL16)
Pick-up vertical path roller-1 clutch (CL20)
Pick-up vertical path roller-2 clutch (CL21)
Pick-up vertical path-1B sensor (PS26)
Pick-up vertical path-2 sensor (PS24)
OHP sensor (PS40)
Multifeeder pick-up sensor (PS8)
Registration paper sensor (PS41)
Pre-registration feeding clutch (CL10)
Registration roller drive clutch (CL9)
Registration roller releasing solenoid (SL9)
Retention brush (high-voltage output)
Transfer brush (high-voltage output)
Separation corona assembly (high-voltage output)
Separation sensor (PS6)
Internal delivery sensor (PS11)
Delivery vertical path-1 sensor (PS28)
Duplexing unit pre-reversal paper sensor (PS29)
Duplexing unit post-reversal paper sensor (PS30)
Duplexing unit outlet paper sensor (PS31)
Delivery paper deflecting plate drive solenoid (SL20)
Duplexing unit reversing assembly switch-back motor (M17)
L-Paper deflecting plate drive solenoid (SL23)
M-Paper deflecting plate drive solenoid (SL24)
S-Paper deflecting plate drive solenoid (SL25)
SS-Paper deflecting plate drive solenoid (SL26)
Paper jogging guide drive motor (M16)
Paper jogging guide home position sensor (PS34)
Duplexing feeding assembly paper sensor (PS33)


Registration roller releasing solenoid (SL9)
Retention brush (high-voltage output)
Transfer brush (high-voltage output)
Separation corona assembly (high-voltage output)
Separation sensor (PS6)
Internal delivery sensor (PS11)
Delivery vertical path-1 sensor (PS28)
Duplexing unit pre-reversal paper sensor (PS29)
Duplexing unit post-reversal paper sensor (PS30)
Duplexing unit outlet paper sensor (PS31)
Delivery paper deflecting plate drive solenoid (SL20)
Duplexing unit reversing assembly switch-back motor (M17)
L-Paper deflecting plate drive solenoid (SL23)
M-Paper deflecting plate drive solenoid (SL24)
S-Paper deflecting plate drive solenoid (SL25)
SS-Paper deflecting plate drive solenoid (SL26)
Paper jogging guide drive motor (M16)
Paper jogging guide home position sensor (PS34)
Duplexing feeding assembly paper sensor (PS33)
Duplexing unit stacking assembly paper sensor (PS32)
Curl pressing sheet solenoid (SL28)
Duplexing unit pick-up assembly stopper plate solenoid (SL27)
Duplexing feeding assembly paper feeding roller down solenoid (SL22)
Duplexing drive clutch (CL22)
Duplexing unit pick-up assembly pick-up solenoid (SL21)
Duplexing unit pick-up clutch (CL19)
Hopper motor (M8)
Separation spacer push-up solenoid (SL7)
Separation claw drive solenoid (SL8)
Brush drive motor home position sensor (PS7)
Brush drive motor (M11)
Cleaning assembly reciprocating motor (M9)
Transfer drum cleaner motor (M10)
Polishing roller drive motor (M18)
Transfer drum drive solenoid (SL13)
Transfer drum cleaner solenoid (SL14)
Oil removing roller solenoid (SL11)
Fixing cleaning belt releasing solenoid (SL5)
Fixing cleaning belt take-up solenoid (SL6)
External delivery sensor (PS27)
Counter

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# B. LIST OF SIGNALS AND ABBREVIATIONS

## 1. SIGNALS

| | |
|---|---|
| A-LEG | A-SIDE SENSOR signal |
| B-LEG | B-SIDE SENSOR signal |
| BK-SGNL | BK-TONER DENSITY SENSOR signal |
| BK-REF | BK-TONER LEVEL SENSOR signal |
| BMTRHP | BRUSH LOCKING/RELEASING MOTOR HP SENSOR signal |
| C-SGNL | C-TONER DENSITY SENSOR signal |
| C1LFU | CASSETTE-1 LIFTER SENSOR signal |
| C1PD | CASSETTE-1 PAPER SENSOR signal |
| C1PW | CASSETTE-1 PAPER WIDTH VR signal |
| C2LFU | CASSETTE-2 LIFTER SENSOR signal (CLC700) |
| C2PD | CASSETTE-2 PAPER SENSOR signal (CLC700) |
| C2PUDC | CASSETTE-2 PICK-UP ASSEMBLY DOOR SWITCH signal (CLC700) |
| C2PW | CASSETTE-2 PAPER WIDTH VR signal (CLC700) |
| C2SZ0 (LEFT) | CASSETTE-2 PAPER LENGTH SENSOR UNIT signal 0 (CLC700) |
| C2SZ1 (RIGHT) | CASSETTE-2 PAPER LENGTH SENSOR UNIT signal 1 (CLC700) |
| C3LFU | CASSETTE-3 LIFTER SENSOR signal (CLC800) |
| C3PD | CASSETTE-3 PAPER SENSOR signal (CLC800) |
| C3PW | CASSETTE-3 PAPER WIDTH VR signal (CLC800) |
| C3SZ0 (LEFT) | CASSETTE-3 PAPER LENGTH SENSOR UNIT signal 0 (CLC800) |
| C3SZ1 (RIGHT) | CASSETTE-3 PAPER LENGTH SENSOR UNIT signal 1 (CLC800) |
| C4LFU | CASSETTE-4 LIFTER SENSOR signal (CLC800) |
| C4PD | CASSETTE-4 PAPER SENSOR signal (CLC800) |
| C4PW | CASSETTE-4 PAPER WIDTH VR signal (CLC800) |
| C4SZ0 (LEFT) | CASSETTE-4 PAPER LENGTH SENSOR UNIT signal 0 (CLC800) |
| C4SZ1 (RIGHT) | CASSETTE-4 PAPER LENGTH SENSOR UNIT signal 1 (CLC800) |
| CL1D* (DEV_M_CL) | M-DEVELOPING CYLINDER CLUTCH command |
| CL2D* (DEV_C_CL) | C-DEVELOPING CYLINDER CLUTCH command |
| CL3D* (DEV_Y_CL) | Y-DEVELOPING CYLINDER CLUTCH command |
| CL4D* (DEV_BK_CL) | BK-DEVELOPING CYLINDER CLUTCH command |
| CL5D* (TONER_M) | M-TONER SUPPLY CLUTCH command |
| CL6D* (TONER_C) | C-TONER SUPPLY CLUTCH command |
| CL7D* (TONER_Y) | Y-TONER SUPPLY CLUTCH command |
| CL8D* (TONER_BK) | BK-TONER SUPPLY CLUTCH command |
| CL9D* | REGISTRATION ROLLER DRIVE CLUTCH command |
| CL10D* | PRE-REGISTRATION FEEDER CLUTCH command |
| CL11D* | PRE-REGISTRATION ROLLER 2 CLUTCH command |
| CL12D* (MF_CL) | MULTIFEEDER PICK-UP CLUTCH command |

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| | |
|---|---|
| CL13D* (C1_PF_CL) | CASSETTE-1 PICK-UP CLUTCH command |
| CL14D* (C2_PF_CL) | CASSETTE-2 PICK-UP CLUTCH command (CLC700) |
| CL15D* | VERTICAL PATH-1 CLUTCH command (CLC700) |
| CL16D* (C3_PF_CL) | CASSETTE-3 PICK-UP CLUTCH command (CLC800) |
| CL17D* (C4_PF_CL) | CASSETTE-4 PICK-UP CLUTCH command (CLC800) |
| CL18D* | VERTICAL PATH-3 CLUTCH command (CLC800) |
| CL19D* (RE_PF_CL) | DUPLEXING PICK-UP CLUTCH command (CLC800) |
| CL20D* | VERTICAL PATH-1 CLUTCH command (CLC800) |
| CL21D* | VERTICAL PATH-2 CLUTCH command (CLC700) |
| CL22D* | DUPLEXING DRIVE CLUTCH command (CLC800) |
| CL23D* | DELIVERY VERTICAL PATH-2 CLUTCH command (CLC800) |
| CNT1D* | COUNTER-2 command |
| CNT2D* | COUNTER-2 command |
| CNT3D* | COUNTER-3 command |
| CNT4D* | COUNTER-4 command |
| CTEP* | C-TONER LEVEL SENSOR signal |
| DELDC | DELIVERY DOOR SENSOR signal |
| DRHOFF | DRUM HEATER command |
| DRUMHP | PHOTOSENSITIVE DRUM HOME POSITION SENSOR signal |
| FM1D* | SCANNING LAMP COOLING FAN-1 command |
| FM2D* | PRIMARY CORONA ASSEMBLY EXHAUST FAN command |
| FM3D* | FIXING EXHAUST FAN command |
| FM4D* | OZONE SUCTION FAN-1 command |
| FM5D* | SCANNING LAMP COOLING FAN-2 command |
| FM6D* | SCANNING LAMP COOLING FAN-3 command |
| FM7D* | SCANNING LAMP COOLING FAN-4 command |
| FM8D* | POWER SUPPLY COOLING FAN command |
| FM9D* | IP COOLING FAN command |
| FM10D* | POWER UNIT FAN-1 command |
| FM12D* | DEVELOPING BIAS PCB COOLING FAN command |
| FM13D* | OZONE SUCTION FAN-2 command |
| FM14D* | FEEDER FAN-1 command |
| FM15-D* | FEEDER FAN-2 command |
| HUM | ENVIRONMENT SENSOR HUMIDITY signal |
| HVATC | ATTRACTION BRUSH ON/OFF CONTROL signal |
| HVATI | ATTRACTION BRUSH LEVEL CONTROL signal |
| HVGI | GRID BIAS LEVEL CONTROL signal |
| HVPR* | PRIMARY CORONA CURRENT ON/OFF signal |
| HVSPC | SEPARATION CORONA ON/OFF CONTROL signal |
| HVSPI | SEPARATION CORONA LEVEL CONTROL signal |
| HVTRC | TRANSFER CORONA ON/OFF CONTROL signal |
| HVTRI | TRANSFER CORONA LEVEL CONTROL signal |


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| | |
|---|---|
| I-REM | INTERNAL STATIC ELIMINATOR ON/OFF CONTROL signal |
| KEYSW | KEY SWITCH signal |
| LAON* | SCANNING LAMP ON signal |
| LA2ON* | PRE-EXPOSURE LAMP ON signal |
| LDC (LEFT_TDR) | LEFT DOOR SENSOR signal |
| M-SGNL | M-TONER DENSITY SENSOR signal |
| M2CLK | DRUM MOTOR ROTATION SPEED signal |
| M2ON* (DRMD) | DRUM MOTOR command |
| M2RDY* (DRMRDY) | DRUM MOTOR READY signal |
| M2SPD0 | DRUM MOTOR SPEED CONTROL signal 0 |
| M2SPD1 | DRUM MOTOR SPEED CONTROL signal 1 |
| M3IDL (LSMSPD) | LASER SCANNER MOTOR IDLE signal |
| M3ON* (LSMD) | LASER SCANNER MOTOR command |
| M3RDY* (LSMRDY) | LASER SCANNER MOTOR READY signal |
| M40N* (MMON) | MAIN MOTOR command |
| M4RDY* (MMRDY) | MAIN MOTOR READY signal |
| M5ON* (FXMD) | FIXING MOTOR command |
| M5RDY* (FXMRDY) | FIXING MOTOR READY signal |
| M5SPD0 | FIXING MOTOR SPEED CONTROL signal 0 |
| M5SPD1 | FIXING MOTOR SPEED CONTROL signal 1 |
| M6ON* | PICK-UP MOTOR command |
| M6RDY* | PICK-UP MOTOR READY signal |
| M7FW (M7D1) | PRIMARY CORONA WIRE CLEANING MOTOR NORMAL DRIVE command |
| M7RV (M7D0) | PRIMARY CORONA WIRE CLEANING MOTOR REVERSE DRIVE command |
| M8D(+)/M8D(–) | HOPPER MOTOR command |
| M9D(+)/M9D(–) | CLEANING ASSEMBLY RECIPROCATING MOTOR command |
| M10ON* (TDCLAMD) | TRANSFER DRUM CLEANER MOTOR command |
| M11_A/M11_B | BRUSH LOCKING/RELEASING MOTOR command |
| M12ON | CASSETTE1 LIFTER MOTOR command |
| M13ON | CASSETTE2 LIFTER MOTOR command (CLC700) |
| M14ON | CASSETTE3 LIFTER MOTOR command (CLC800) |
| M15ON | CASSETTE4 LIFTER MOTOR command (CLC800) |
| M16_A/M16_B | PAPER JOGGING GUIDE DRIVE MOTOR command (CLC800) |
| M17_A/M17_B | DUPLEXING UNIT REVERSING ASSEMBLY SWITCH-BACK MOTOR command (CLC800) |
| M18_A/M18_B (M18ON) | POLISHING ROLLER DRIVE MOTOR command |
| MFPD | MULTIFEEDER PAPER SENSOR signal |
| MFPPD* | MULTIFEEDER PICK-UP SENSOR signal |
| MFPW | MULTIFEEDER PAPER WIDTH VR signal |
| MTEP* | M-TONER LEVEL SENSOR signal |

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| | |
|---|---|
| O-REM | EXTERNAL STATIC ELIMINATER ON/OFF CONTROL signal |
| OEP* (OILEP) | OIL LEVEL SENSOR signal |
| OHPD (OHP) | OHP SENSOR signal |
| PGHP | PAPER JOGGING GUIDE HOME POSITION SENSOR signal (CLC800) |
| PS4D (TRNS_1) | PRE-TRANSFER PAPER SENSOR signal |
| PS5D (TRNS_2) | POST-TRANSFER PAPER SENSOR signal |
| PS6D (SPRT) | SEPARATION SENSOR signal |
| PS11D (DLVRY_I) | INTERNAL DELIVERY SENSOR signal |
| PS19D | PICK-UP VERTICAL PATH-1 SENSOR signal (CLC700) |
| PS24D | PICK-UP VERTICAL PATH-2 SENSOR signal (CLC800) |
| PS25D | PICK-UP VERTICAL PATH-3 SENSOR signal (CLC800) |
| PS26D | PICK-UP VERTICAL PATH-1B SENSOR signal (CLC800) |
| PS27D (DLVRY_O) | EXTERNAL DELIVERY SENSOR signal |
| PS28D | DELIVERY VERTICAL PATH SENSOR signal (CLC800) |
| PS29D (REV_BF) | DUPLEXING UNIT PRE-REVERSAL PAPER signal SENSOR (CLC800) |
| PS30D (REV_AFT) | DUPLEXING UNIT POST-REVERSAL PAPER SENSOR signal (CLC800) |
| PS31D (REV_EXIT) | DUPLEXING UNIT REVERSAL OUTLET PAPER SENSOR signal (CLC800) |
| PS32D (DUP_PD) | DUPLEXING UNIT STACKING ASSEMBLY PAPER SENSOR signal (CLC800) |
| PS33D | DUPLEXING UNIT FEEDER PAPER SENSOR signal (CLC800) |
| PS39D | DUPLEXING UNIT REVERSING ASSEMBLY DOOR SENSOR signal (CLC800) |
| PS41D (RGST) | REGISTRATION PAPER SENSOR signal |
| RS43D (FOR FUTURE, TYPE 2 ONLY) | PRE-PHOTOSENSITIVE DRUM PAPER SENSOR signal |
| PWOFF | MAIN SWITCH signal |
| RDC (RGHT_DR) | RIGHT DOOR SENSOR signal |
| RVDC (REV_DR) | DUPLEXING UNIT REVERSING ASSEMBLY DOOR SWITCH signal (CLC800) |
| RVPUDC (FEED_DR) | DUPLEXING UNIT PICK-UP DOOR SWITCH signal (CLC800) |
| SCHP | SCANNER HOME POSITION SENSOR signal |
| SL1D* | M-DEVELOPING ASSEMBLY ENGAGING SOLENOID command |
| SL2D* | C-DEVELOPING ASSEMBLY ENGAGING SOLENOID command |
| SL3D* | Y-DEVELOPING ASSEMBLY ENGAGING SOLENOID command |
| SL4D* | K-DEVELOPING ASSEMBLY ENGAGING SOLENOID command |
| SL5D* (WEB_SWNG) | CLEANING WEB RELEASING SOLENOID command |
| SL6D* (WEB_WIND) | CLEANING WEB TAKE-UP SOLENOID command |
| SL7D* | SEPARATION SPACER PUSH-UP SOLENOID command |
| SL8D* (SPRT) | SEPARATION CLAW DRIVE SOLENOID command |
| SL9D* | REGISTRATION ROLLER RELEASING SOLENOID command |
| SL10D* | RETENTION GUIDE DRIVE SOLENOID command |
| SL11D* (OIL_CLRR) | OIL REMOVING ROLLER SOLENOID command |


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| | |
|---|---|
| SL12D* (OIL_PMP) | OIL PUMP DRIVE SOLENOID command |
| SL13D* | TRANSFER DRUM LOCKING/RELEASING SOLENOID command |
| SL14D* | TRANSFER DRUM CLEANER SOLENOID command |
| SL15D* | MULTIFEEDER PICK-UP SOLENOID command |
| SL16D* (C1_PU_SL) | CASSETTE-1 PICK-UP SOLENOID command |
| SL17D* (C2_PU_SL) | CASSETTE-2 PICK-UP SOLENOID command (CLC700) |
| SL18D* (C3_PU_SL) | CASSETTE-3 PICK-UP SOLENOID command (CLC800) |
| SL19D* (C4_PU_SL) | CASSETTE-4 PICK-UP SOLENOID command (CLC800) |
| SL20D* (DEL_FLP) | DELIVERY PAPER DEFLECTOR DRIVE SOLENOID command (CLC800) |
| SL21D* (DU_PU_SL) | ASSEMBLY PICK-UP SOLENOID command (CLC800) |
| SL22D* | DUPLEXING UNIT PICK-UP ASSEMBLY PAPER FEEDING ROLLER SOLENOID command |
| SL23D* (DP_L_FLP) | L-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800) |
| SL24D* (DP_M_FLP) | M-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800) |
| SL25D* (DP_S_FLP) | S-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800) |
| SL26D* (DP_SS_FLP) | SS-PAPER DEFLECTOR DRIVE SOLENOID command (CLC800) |
| SL27DD | DUPLEXING UNIT PICK-UP ASSEMBLY STOP PLATE DRIVE SOLENOID DOWN command |
| SL27DU | DUPLEXING UNIT PICK-UP ASSEMBLY STOP PLATE DRIVE SOLENOID UP command |
| SL28D* | CURL PRESSING SHEET SOLENOID command |
| TEMP | ENVIRONMENT SENSOR TEMPERATURE signal |
| THM1 | UPPER FIXING ROLLER TEMPERATURE signal |
| THM2 | LOWER FIXING ROLLER TEMPERATURE signal |
| UHON | UPPER FIXING HEATER command |
| WEBD | FIXING ROLLER CLEANING WEB SENSOR signal |
| WTBD | WASTE TONER FEEDING SCREW LOCK DETECTING SWITCH signal |
| WTONER | WASTE TONER FULL SENSOR signal |
| Y-SGNL | Y-TONER DENSITY SENSOR signal |
| YTEP* | Y-TONER LEVEL SENSOR signal |

## 2. LIST OF ABBREVIATIONS

| | |
|---|---|
| CNTR | CONTROL ROTATION |
| COPY | COPY |
| DSRDY | SCANNER READY |
| INTR | INITIAL ROTATION |
| LSTR | LAST ROTATION |
| STBY | STANDBY |
| WMPU | WARM UP |

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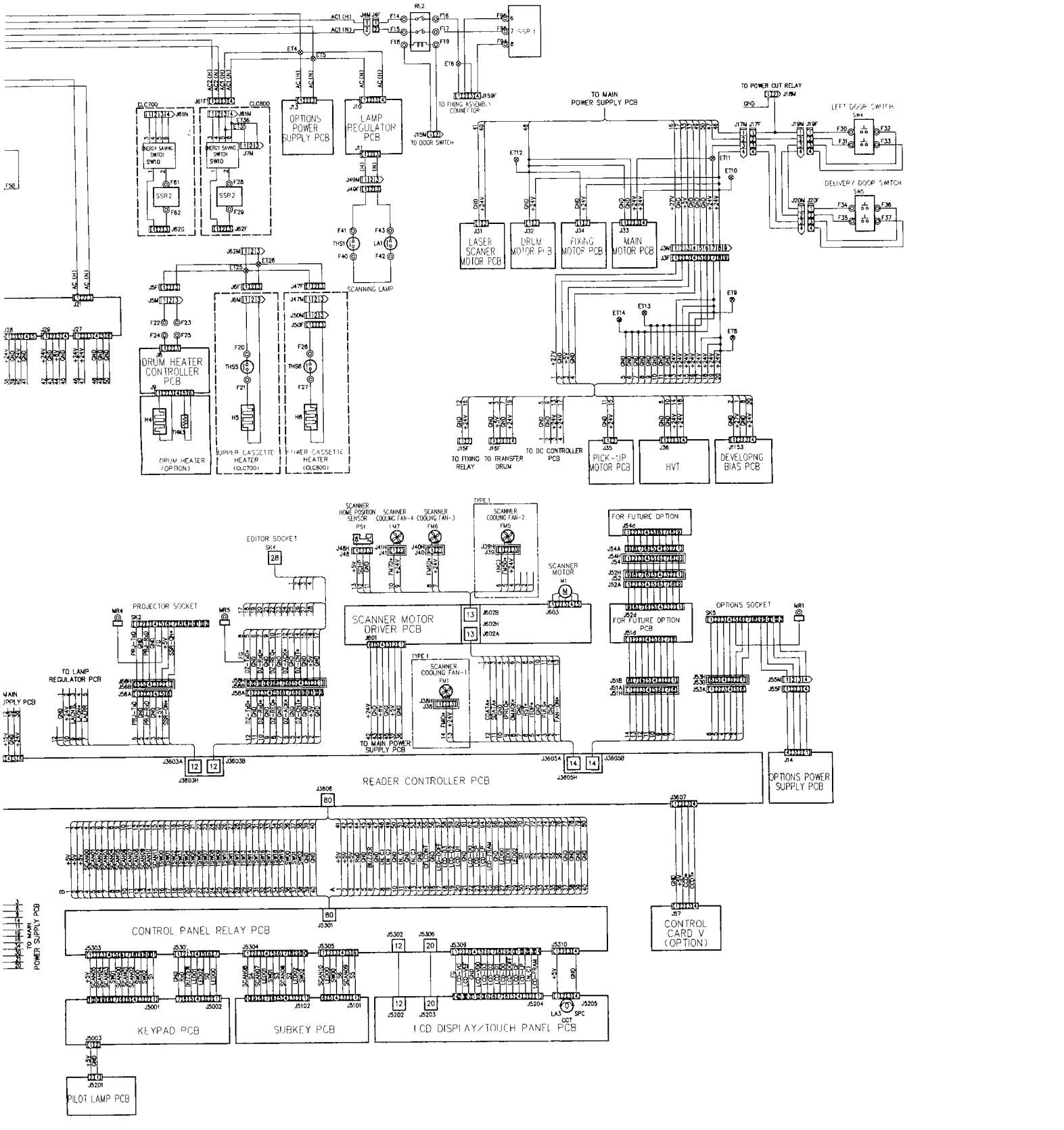
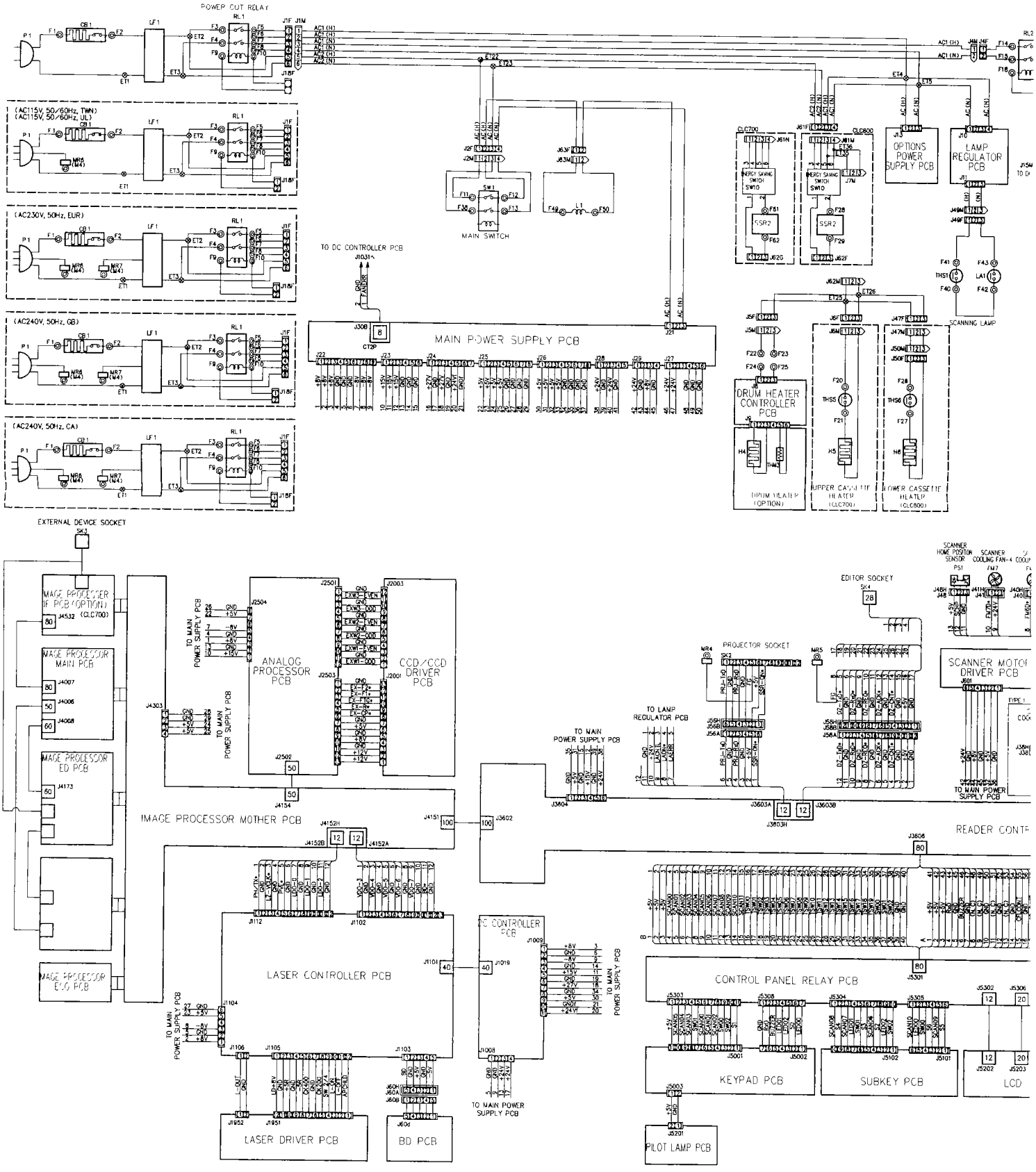
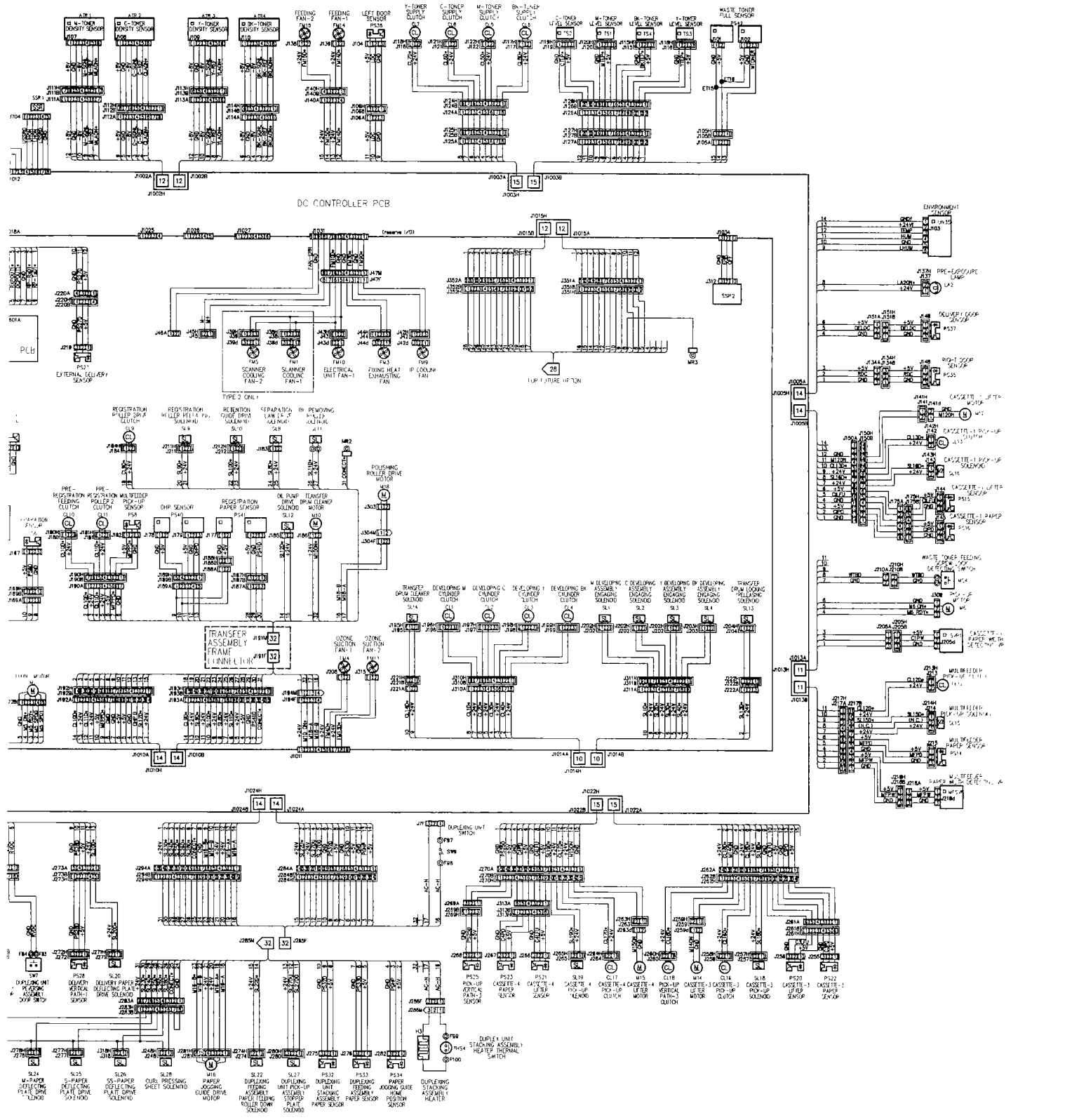
## C. GENERAL CIRCUIT DIAGRAM

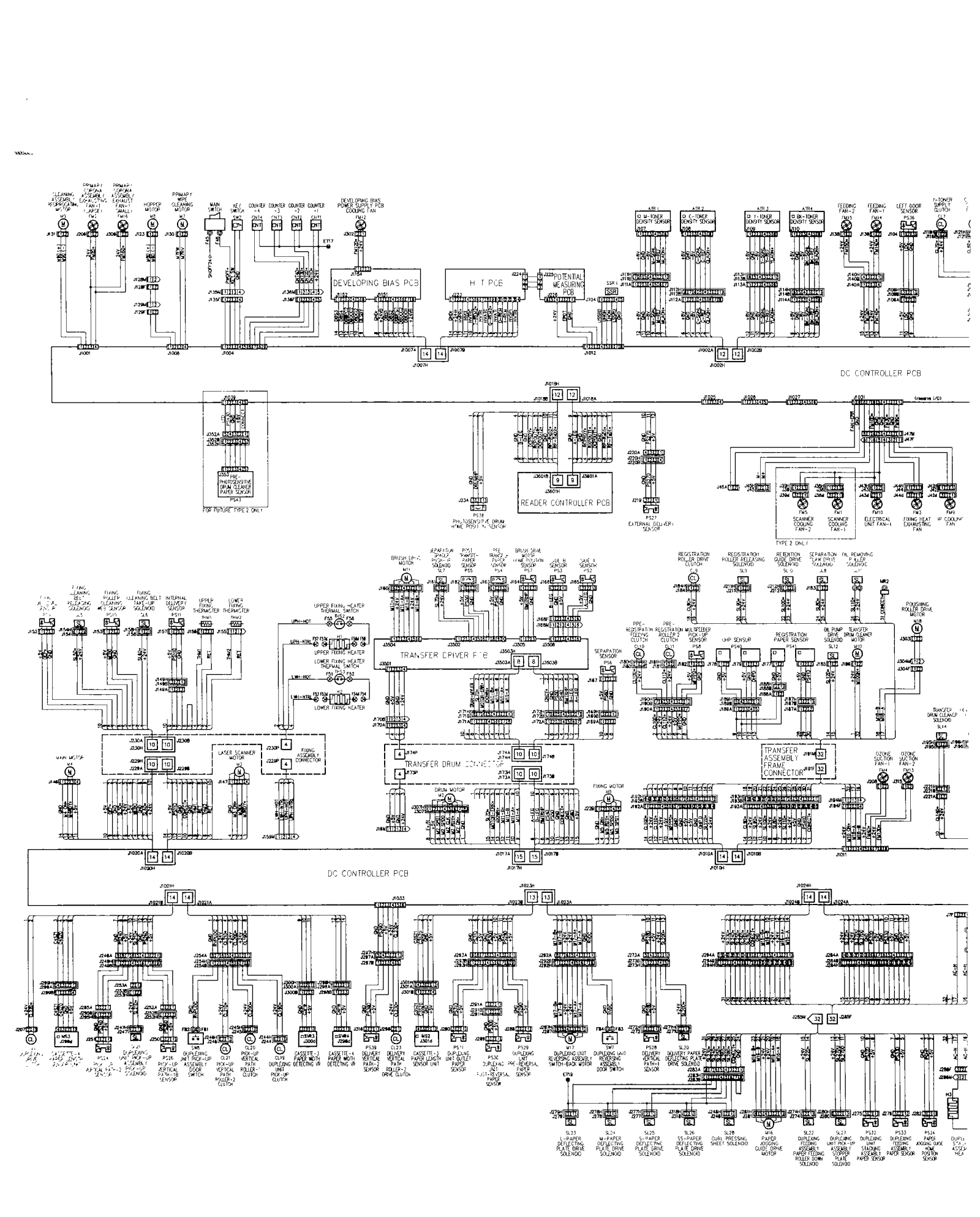
**General circuit diagram (1/3)**




POWER CUT RELAY
(AC115V, 50/60Hz, TWN)
(AC115V, 50/60Hz, UL)
(AC230V, 50Hz, EUR)
(AC240V, 50Hz, GB)
(AC240V, 50Hz, CA)
TO DC CONTROLLER PCB
MAIN SWITCH
MAIN POWER SUPPLY PCB
OPTIONS POWER SUPPLY PCB
LAMP REGULATOR PCB
DRUM HEATER CONTROLLER PCB
SCANNING LAMP
EXTERNAL DEVICE SOCKET
IMAGE PROCESSOR IF PCB (OPTION)
IMAGE PROCESSOR MAIN PCB
IMAGE PROCESSOR ED PCB
IMAGE PROCESSOR E-IO PCB
IMAGE PROCESSOR MOTHER PCB
ANALOG PROCESSOR PCB
CCD/CCD DRIVER PCB
LASER CONTROLLER PCB
LASER DRIVER PCB
BD PCB
DC CONTROLLER PCB
EDITOR SOCKET
PROJECTOR SOCKET
TO LAMP REGULATOR PCB
SCANNER MOTOR DRIVER PCB
CONTROL PANEL RELAY PCB
KEYPAD PCB
SUBKEY PCB
LCD
PILOT LAMP PCB

**General circuit diagram (2/3)**



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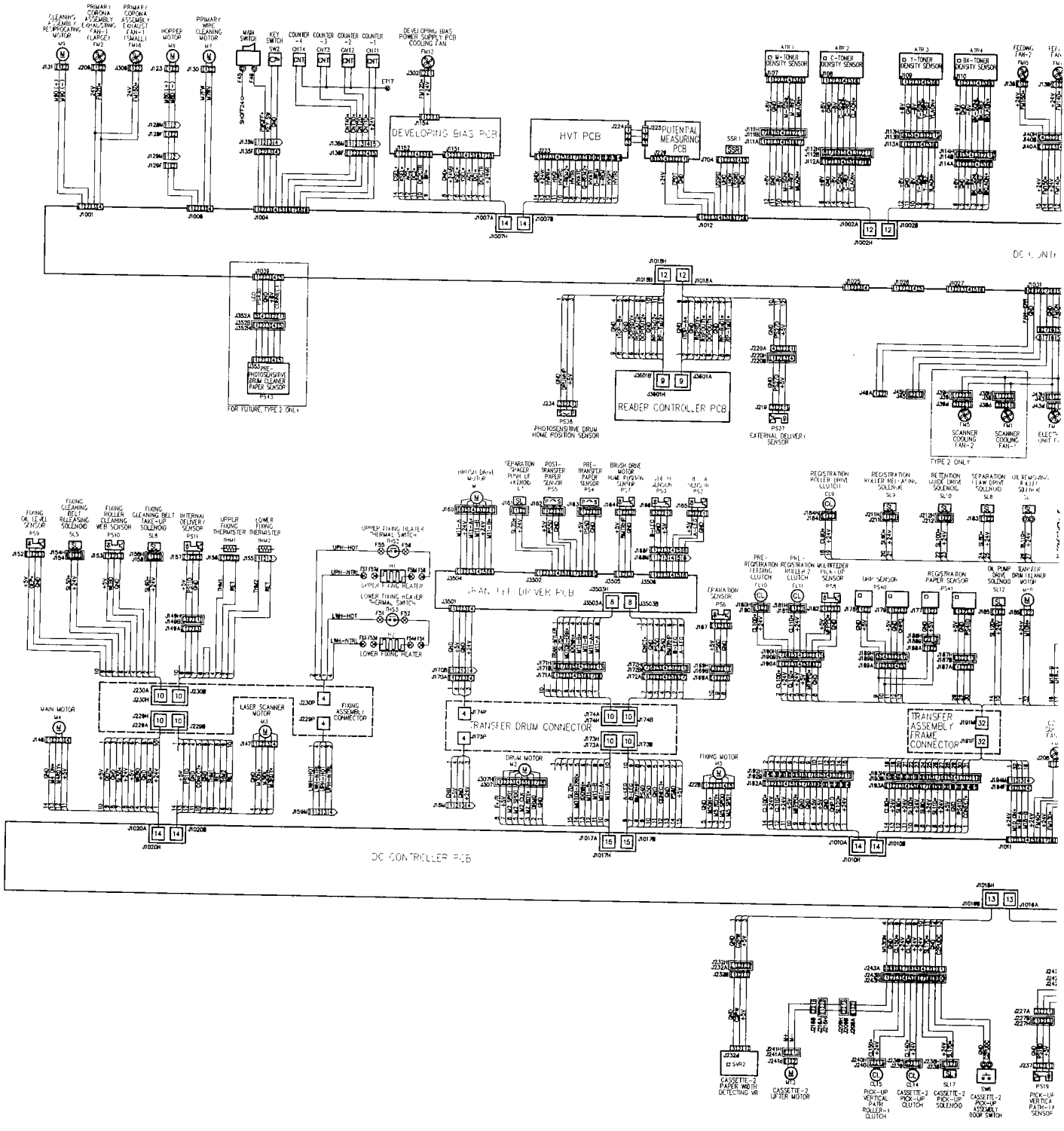
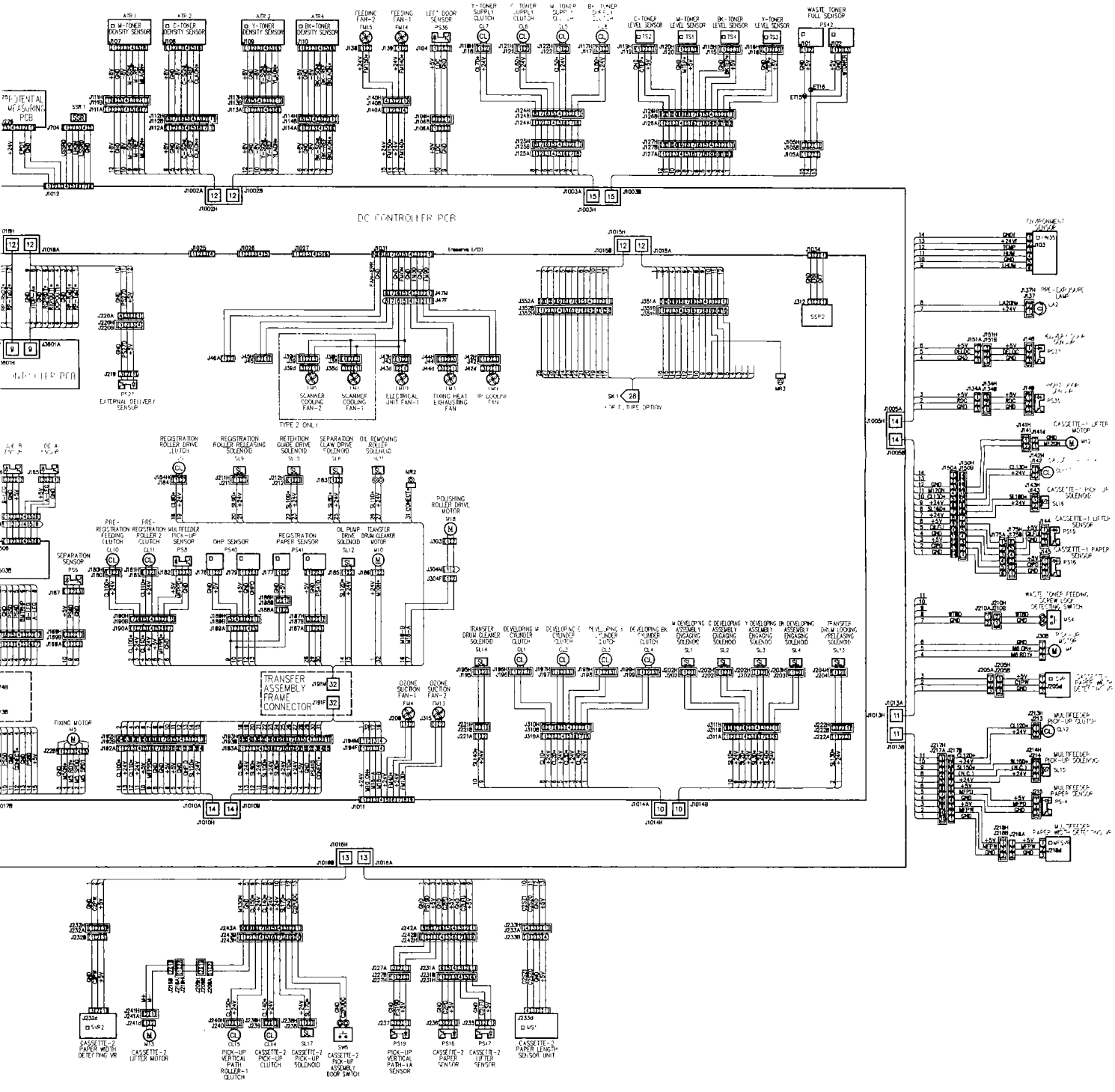
**General circuit diagram (3/3)**



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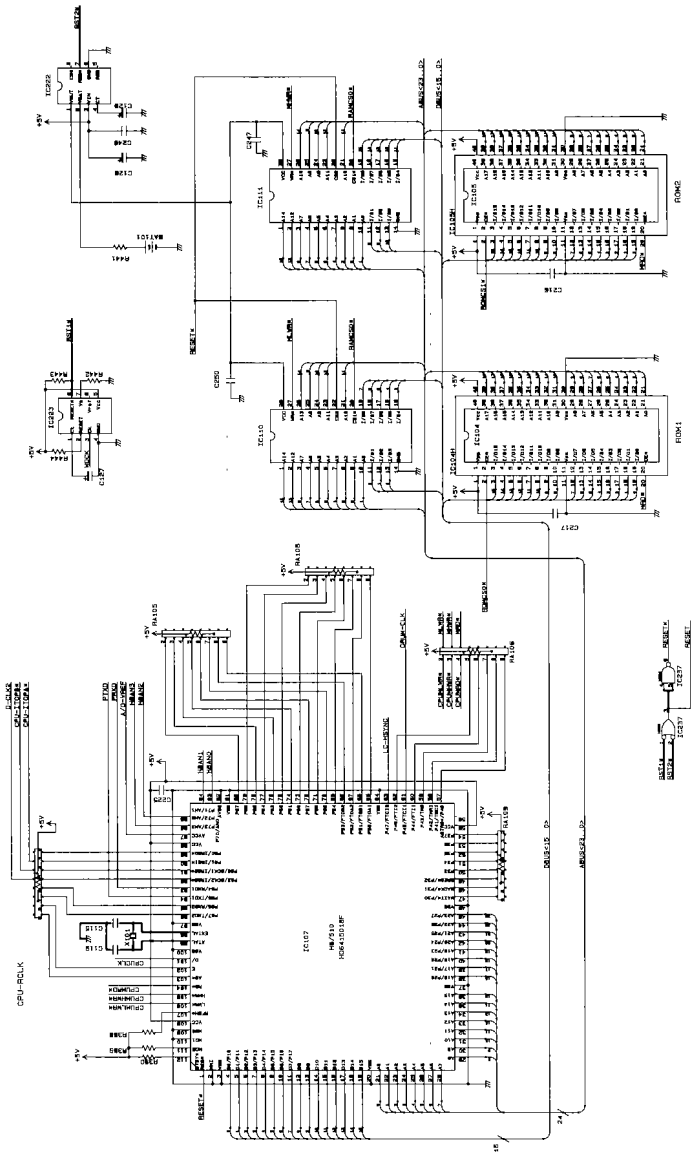
# D. DC CONTROLLER CIRCUIT DIAGRAM

## DC controller circuit diagram (CLC700) (1/21)



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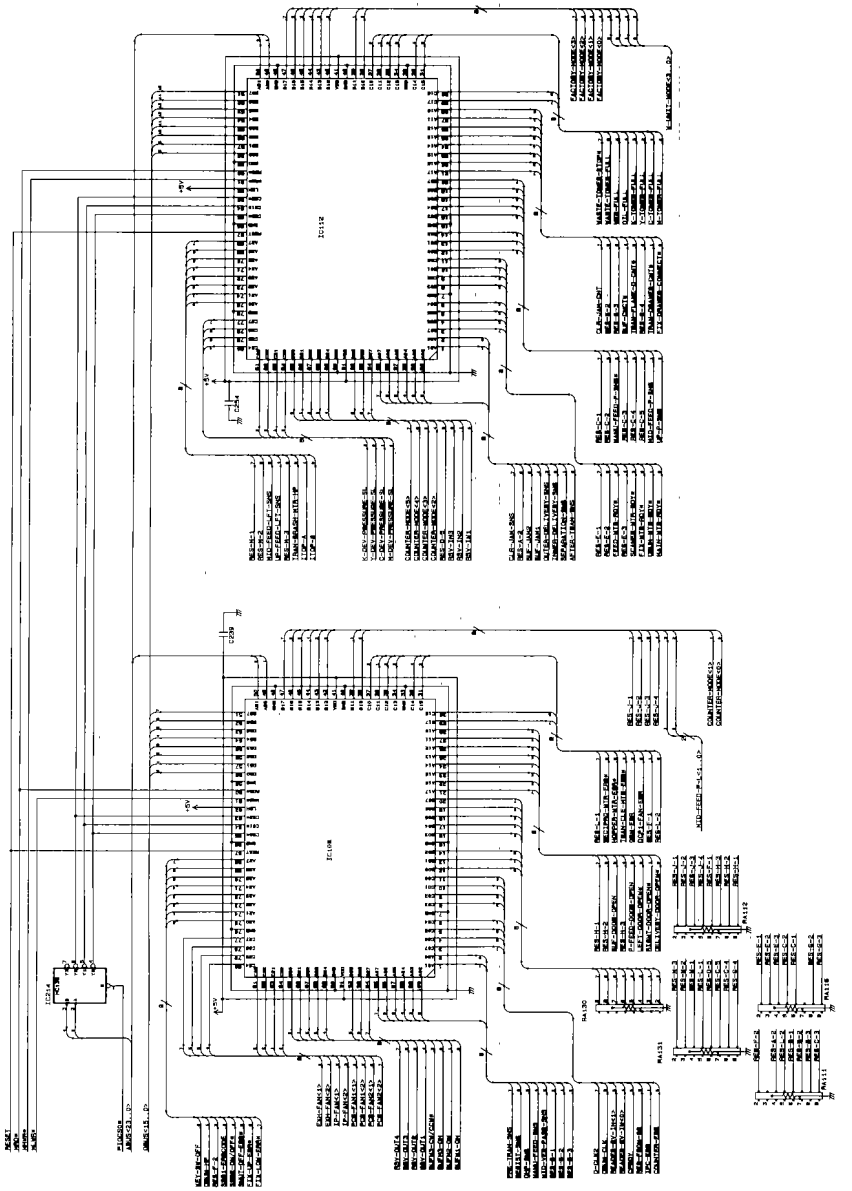
## DC controller circuit diagram (CLC700) (2/21)

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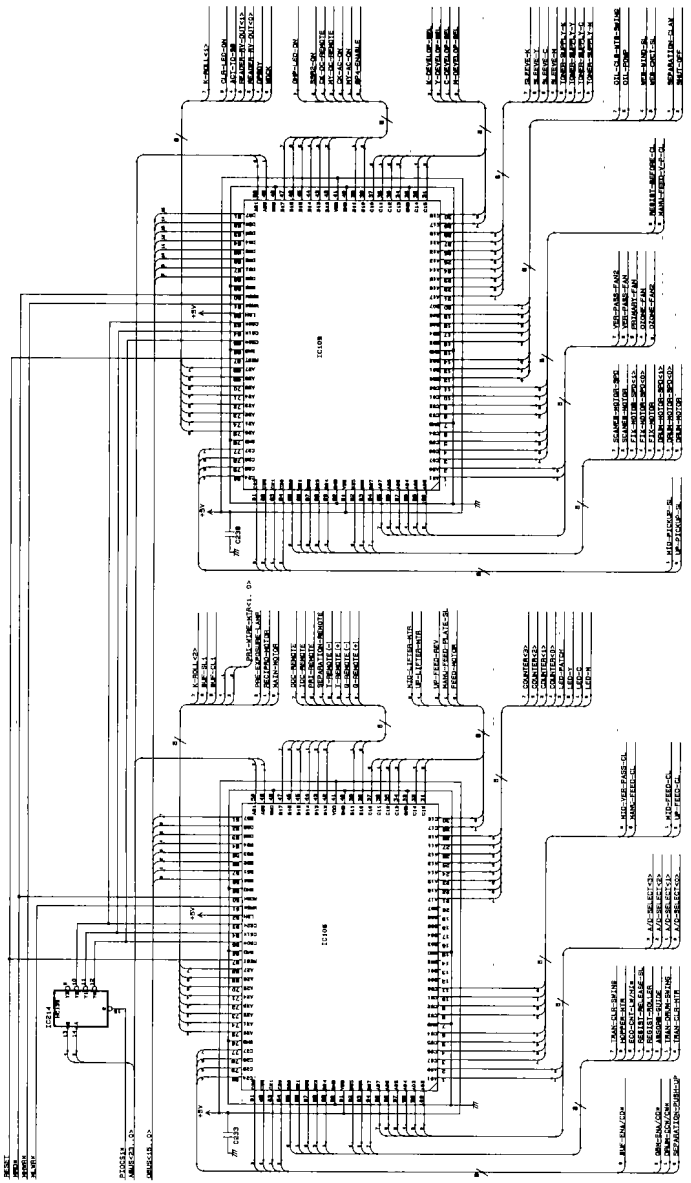
## DC controller circuit diagram (CLC700) (3/21)



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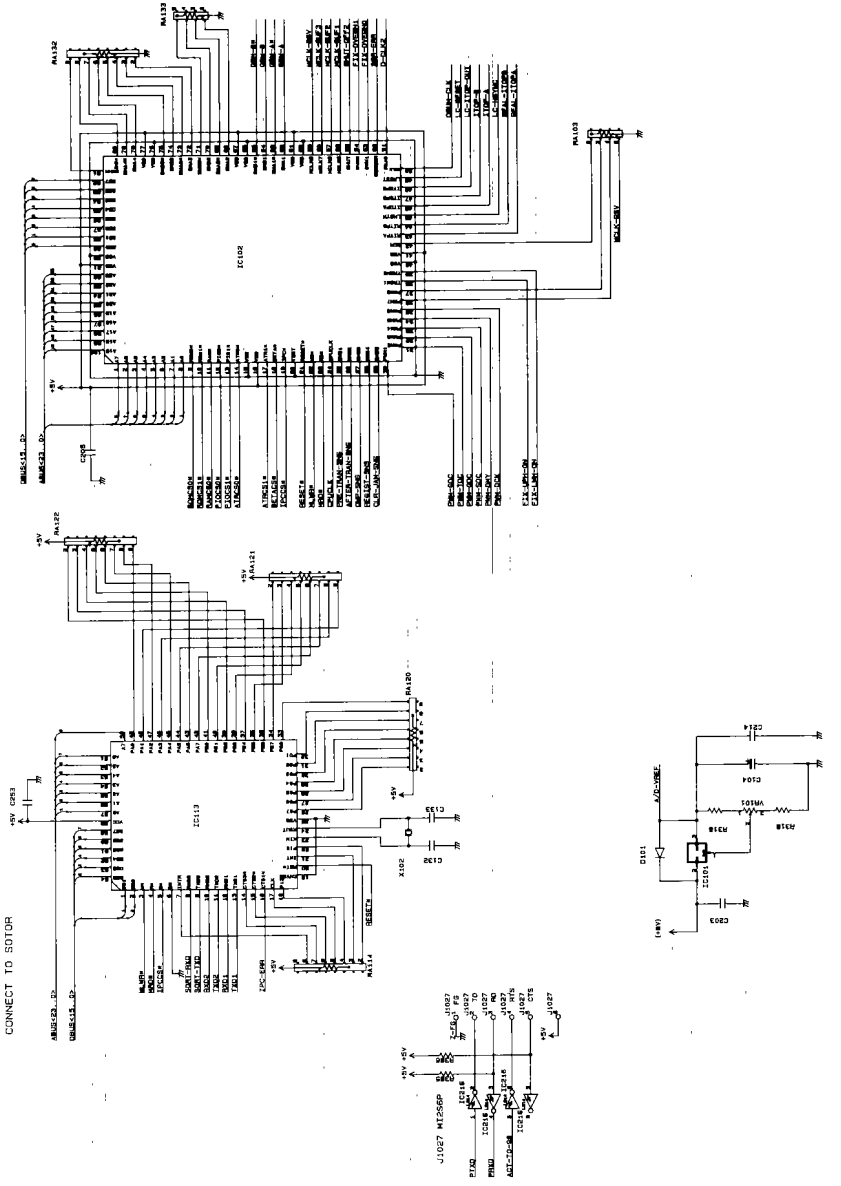
## DC controller circuit diagram (CLC700) (4/21)





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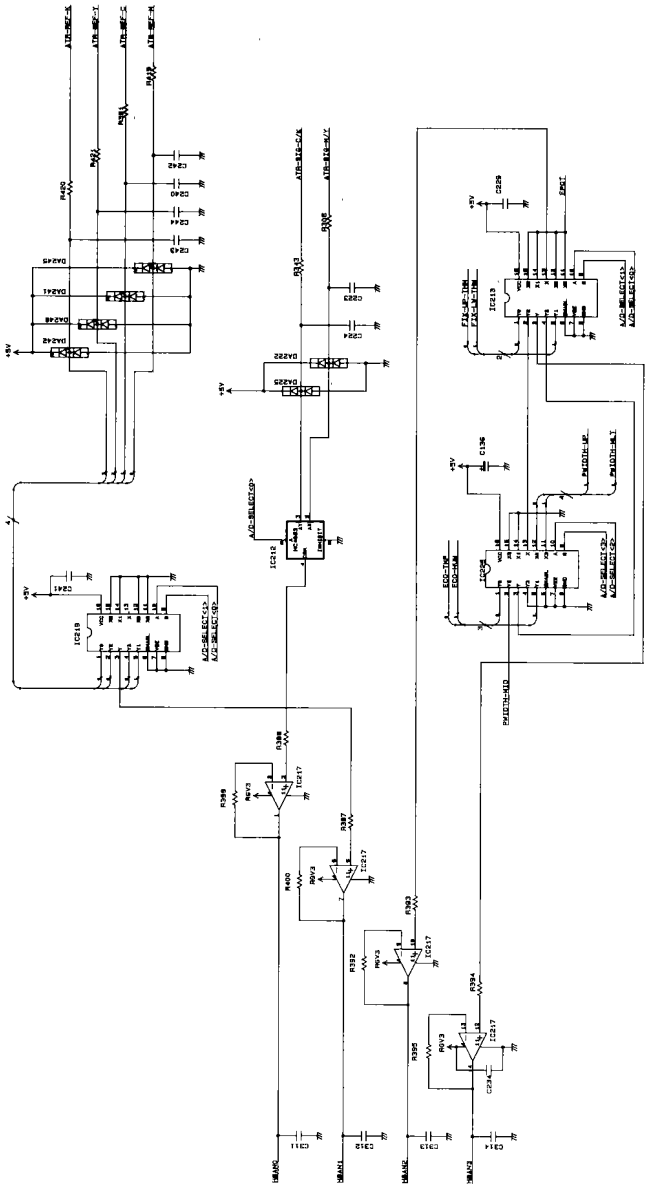
## DC controller circuit diagram (CLC700) (5/21)



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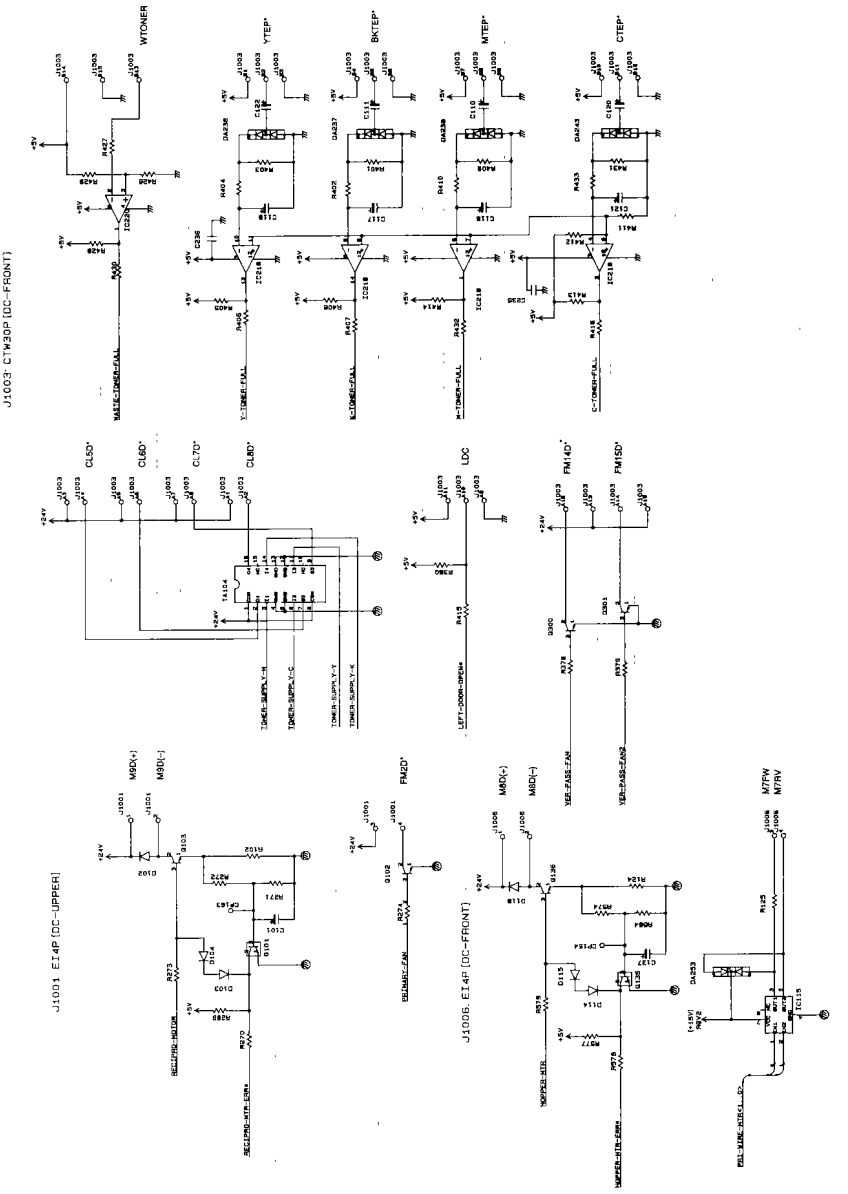
## DC controller circuit diagram (CLC700) (6/21)





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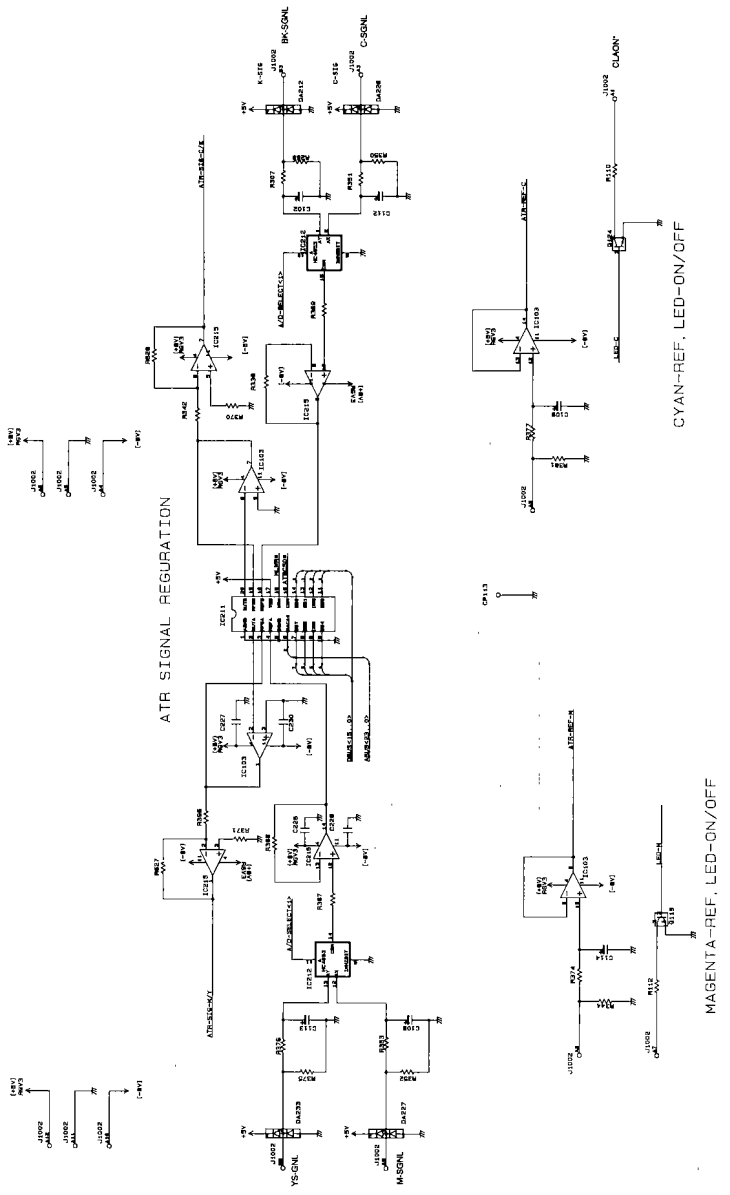
## DC controller circuit diagram (CLC700) (7/21)

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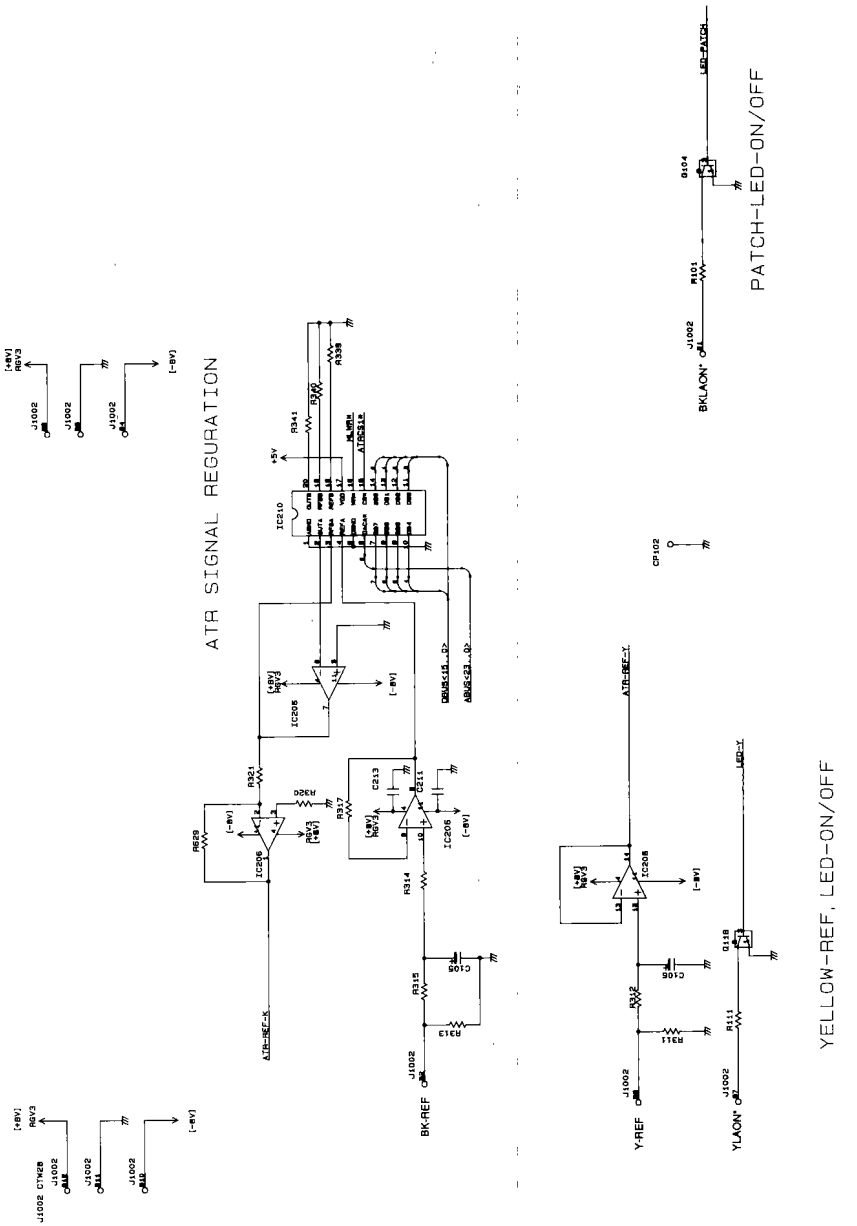
## DC controller circuit diagram (CLC700) (8/21)





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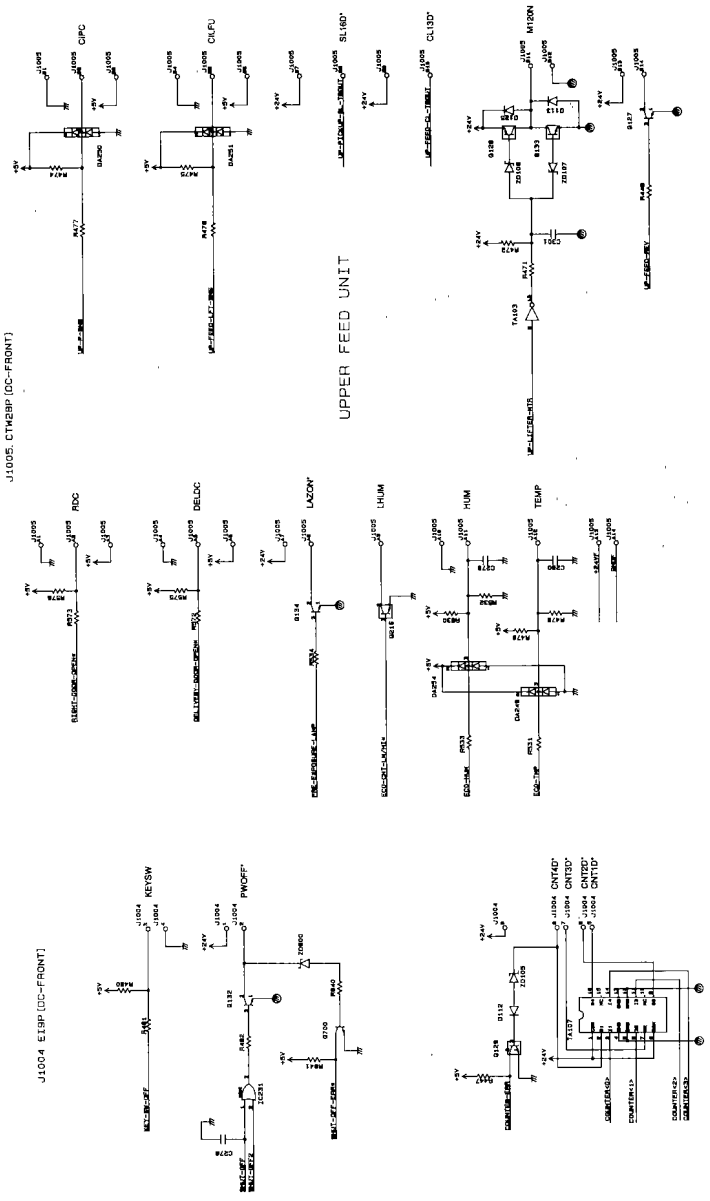
## DC controller circuit diagram (CLC700) (9/21)



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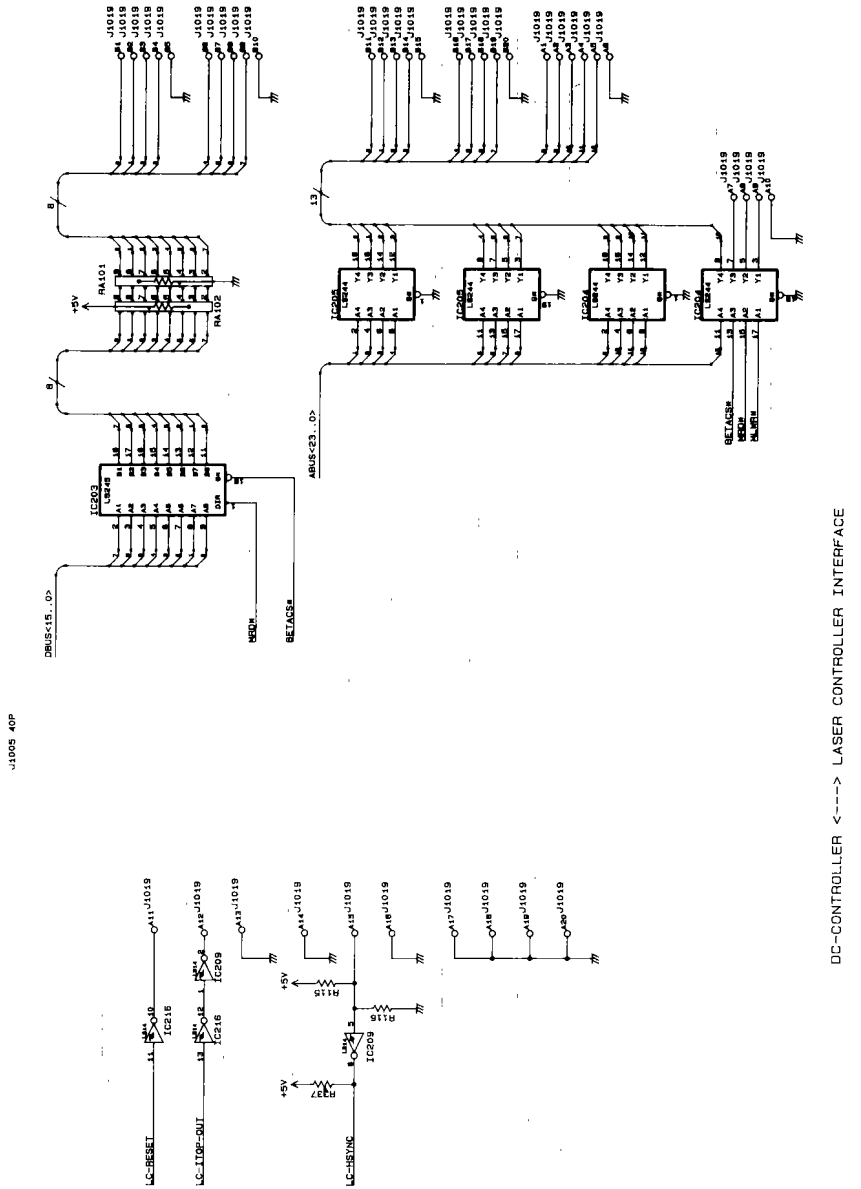



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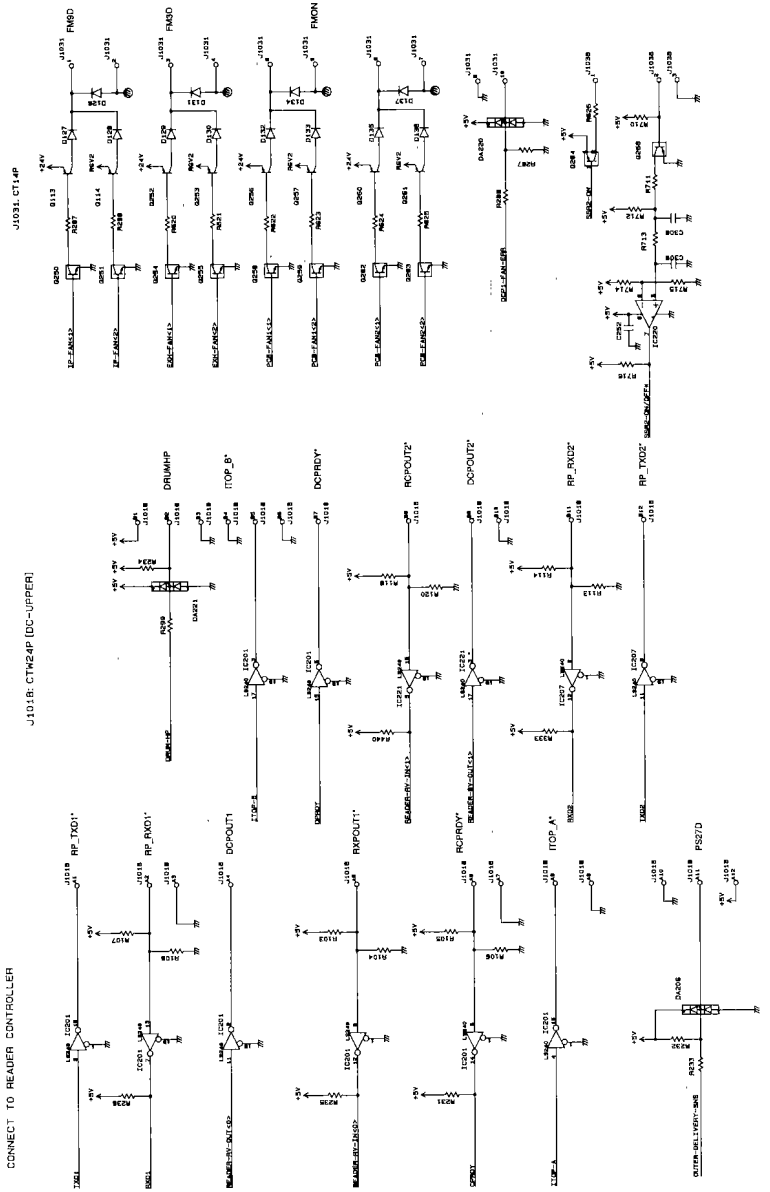
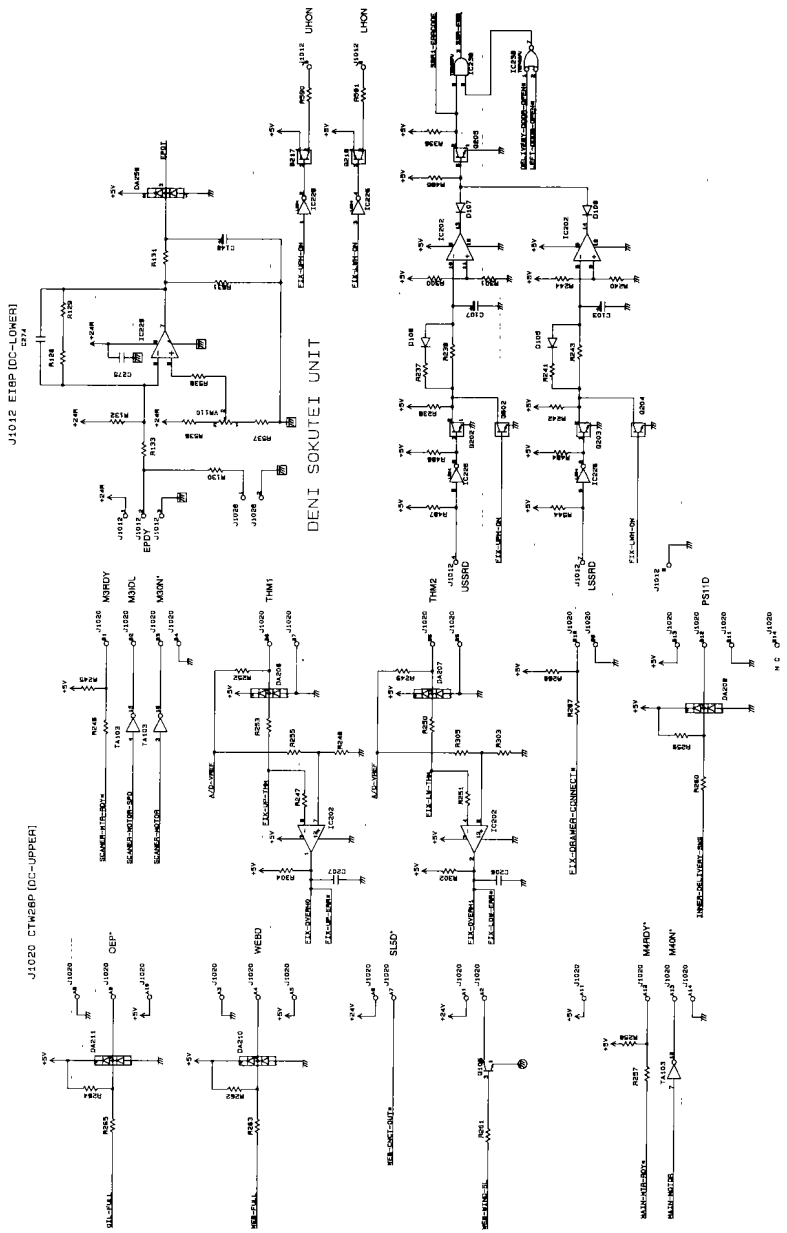
## DC controller circuit diagram (CLC700) (11/21)



## DC controller circuit diagram (CLC700) (12/21)





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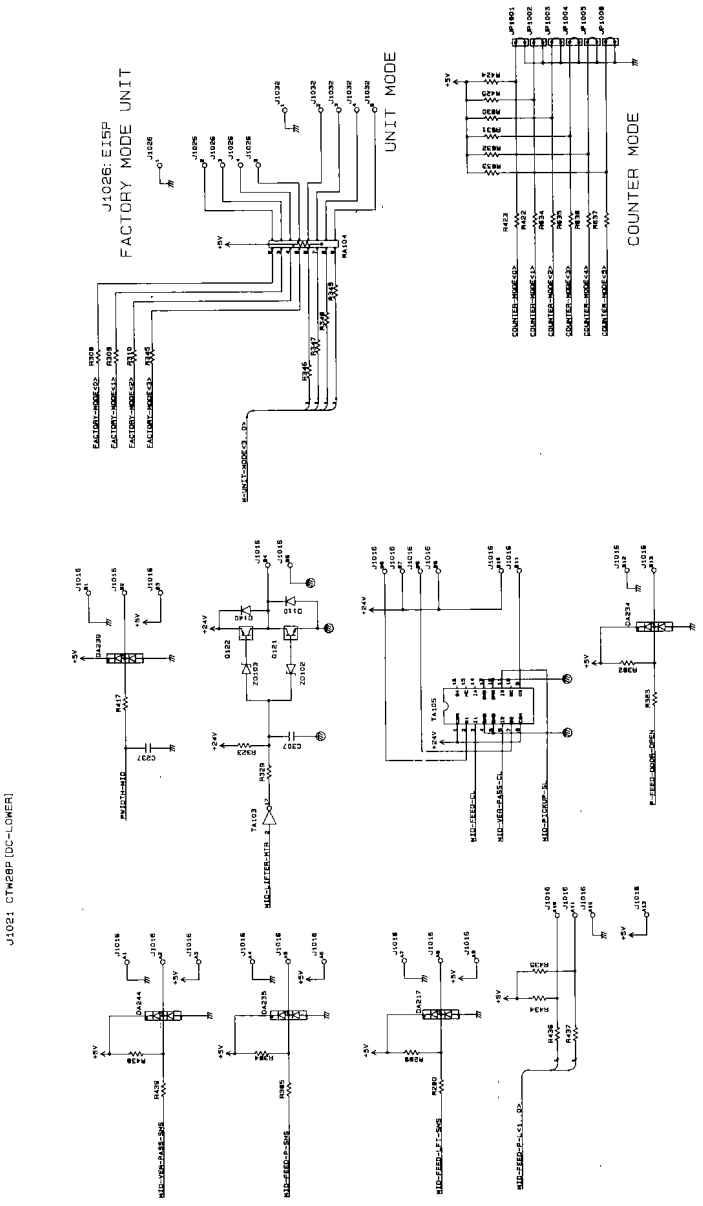
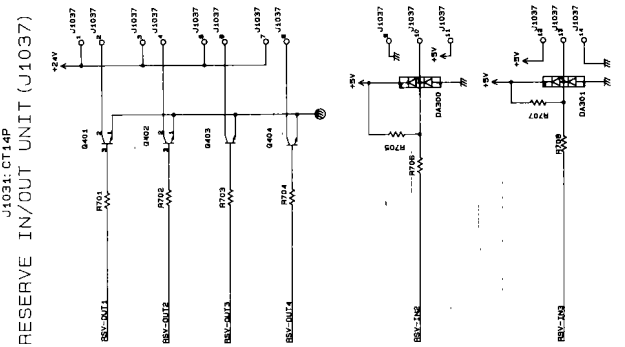
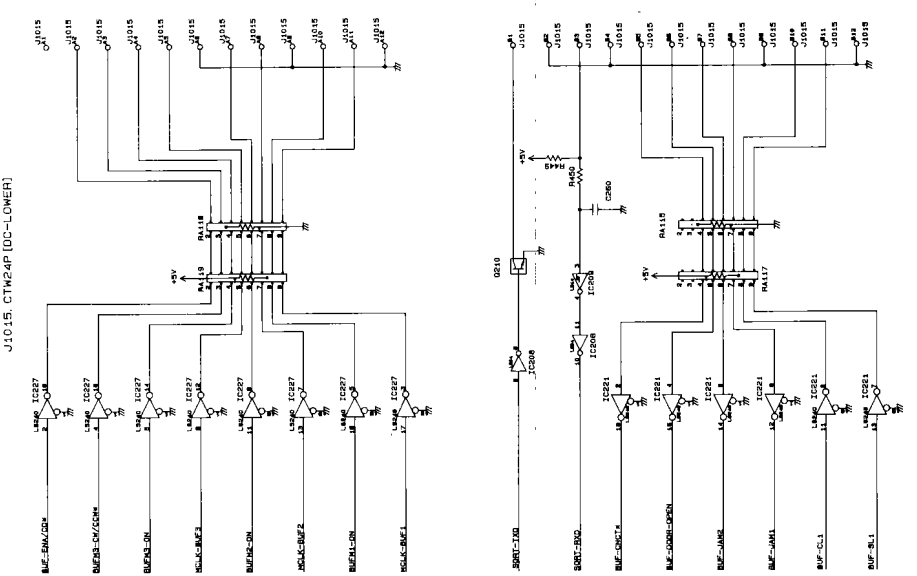
## DC controller circuit diagram (CLC700) (13/21)



## DC controller circuit diagram (CLC700) (14/21)





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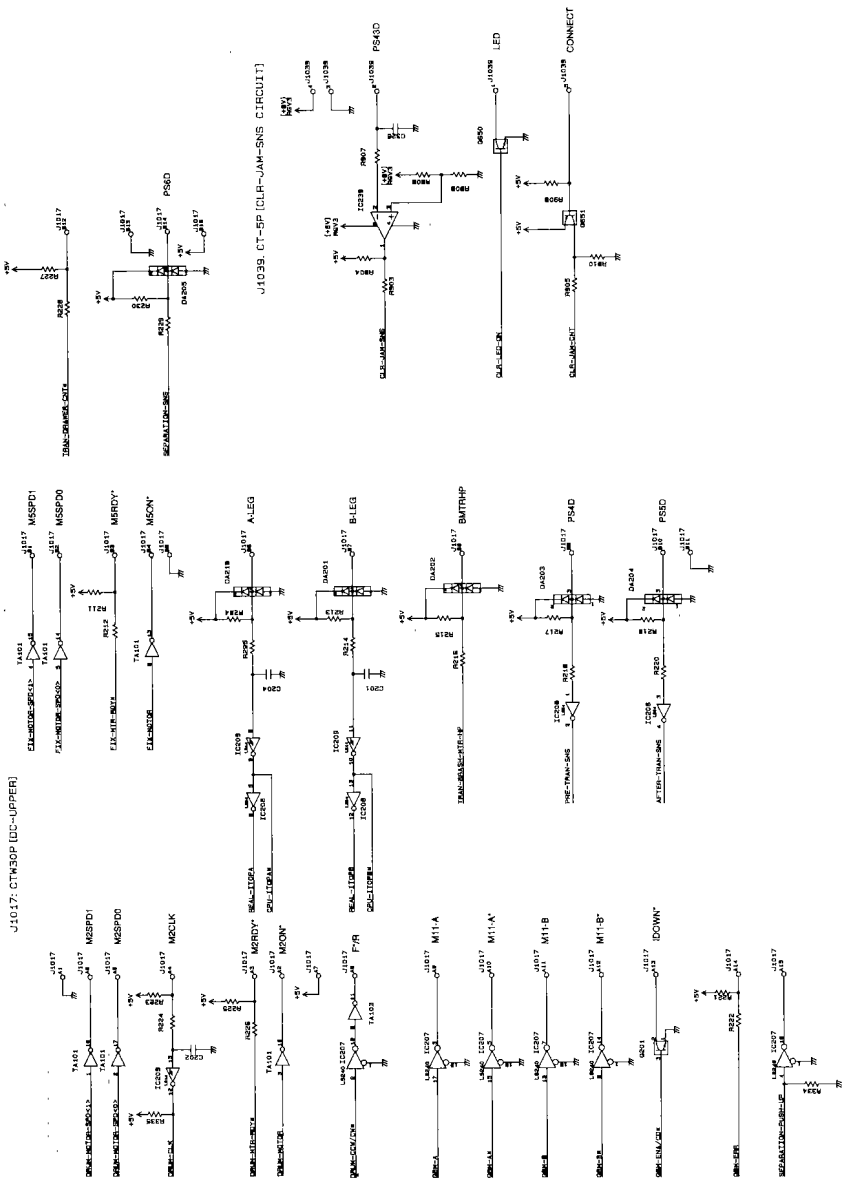
## DC controller circuit diagram (CLC700) (15/21)



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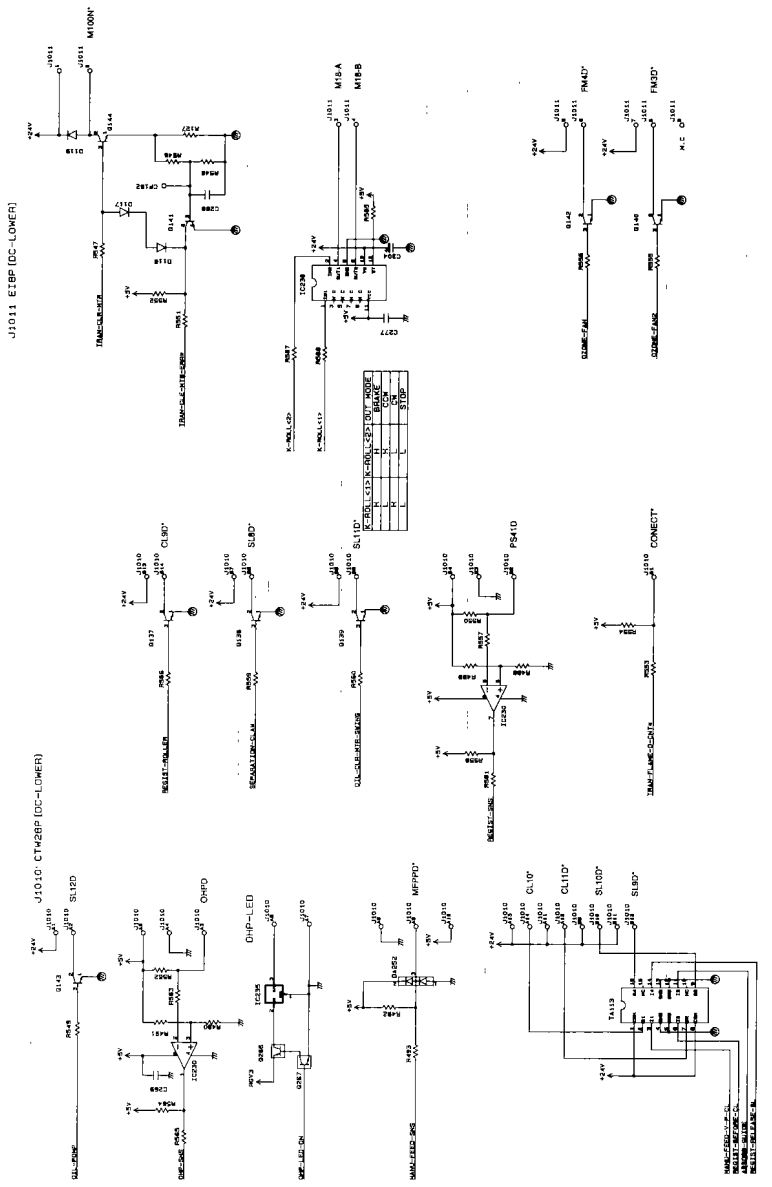
## DC controller circuit diagram (CLC700) (16/21)

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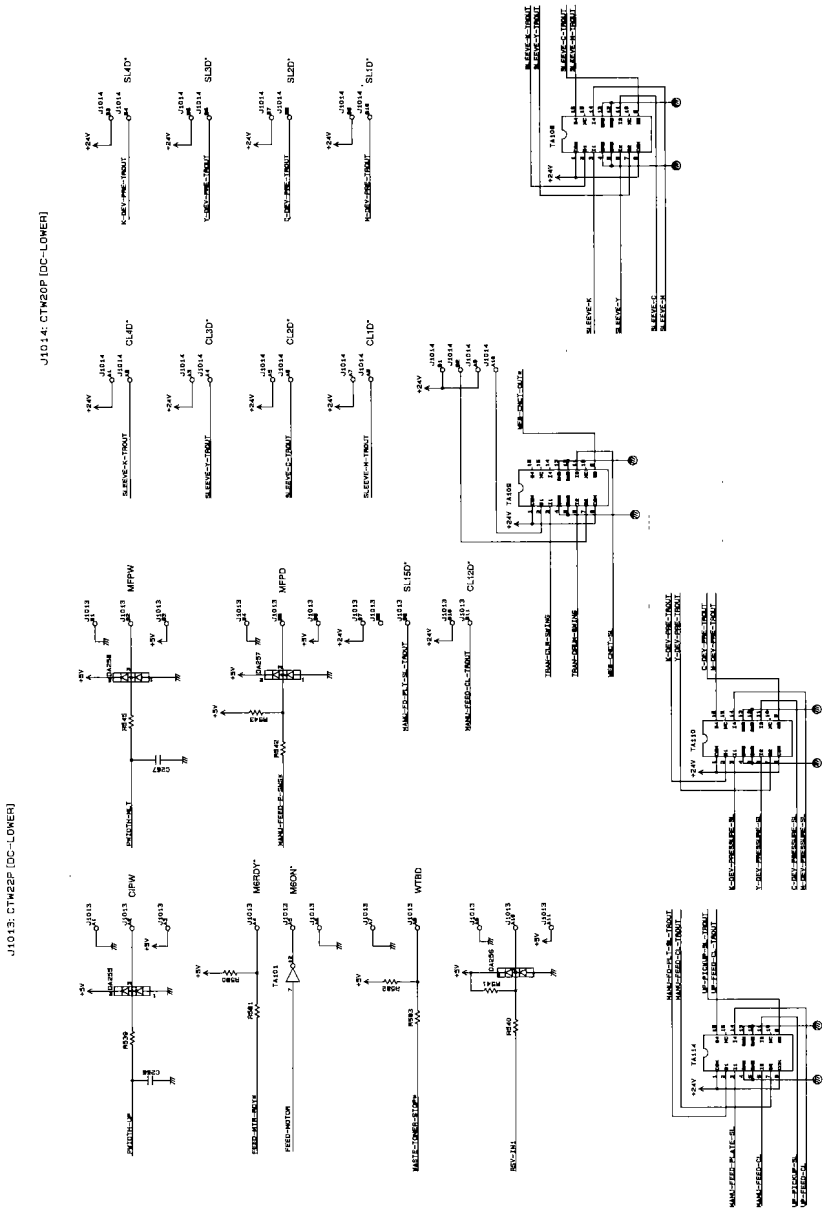
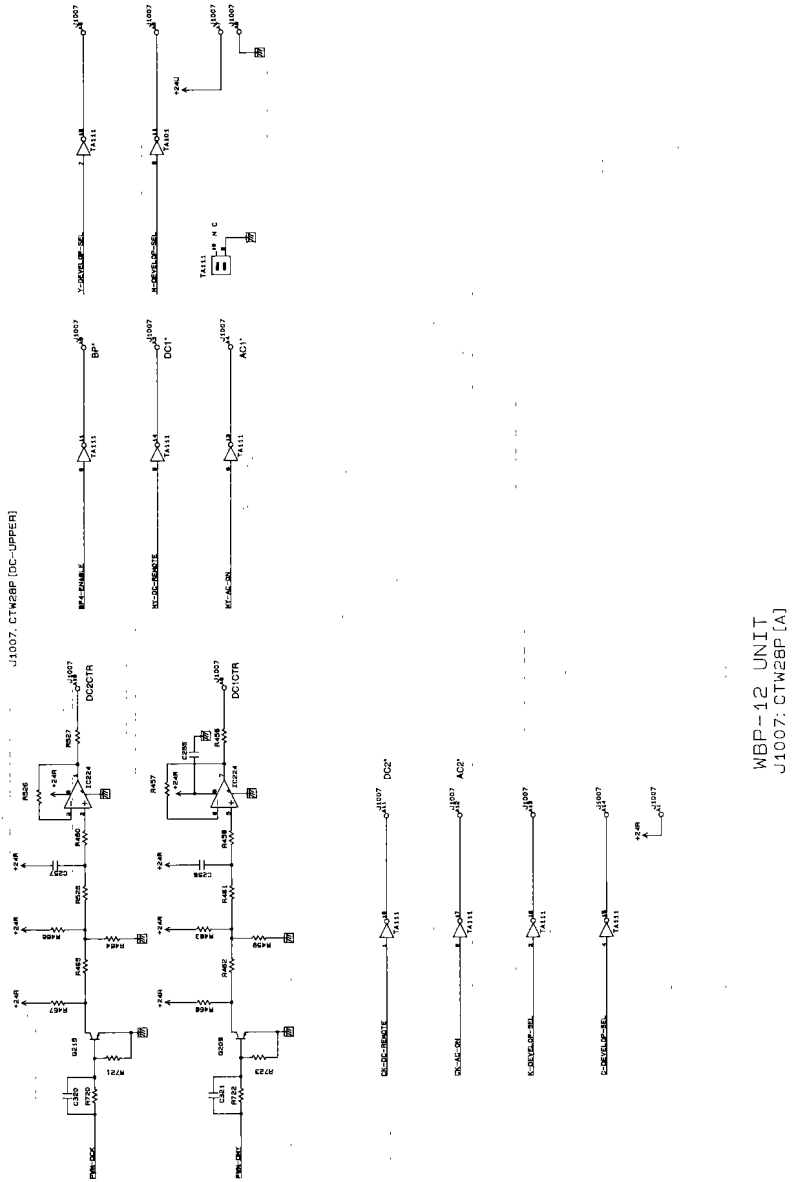
## DC controller circuit diagram (CLC700) (17/21)



## DC controller circuit diagram (CLC700) (18/21)





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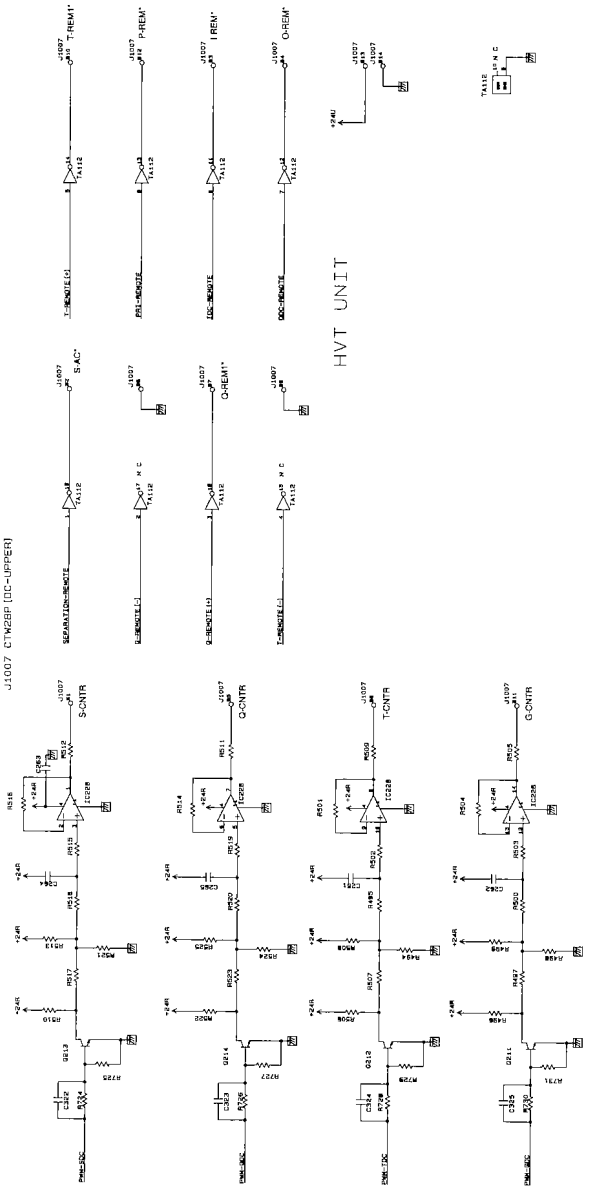
## DC controller circuit diagram (CLC700) (19/21)

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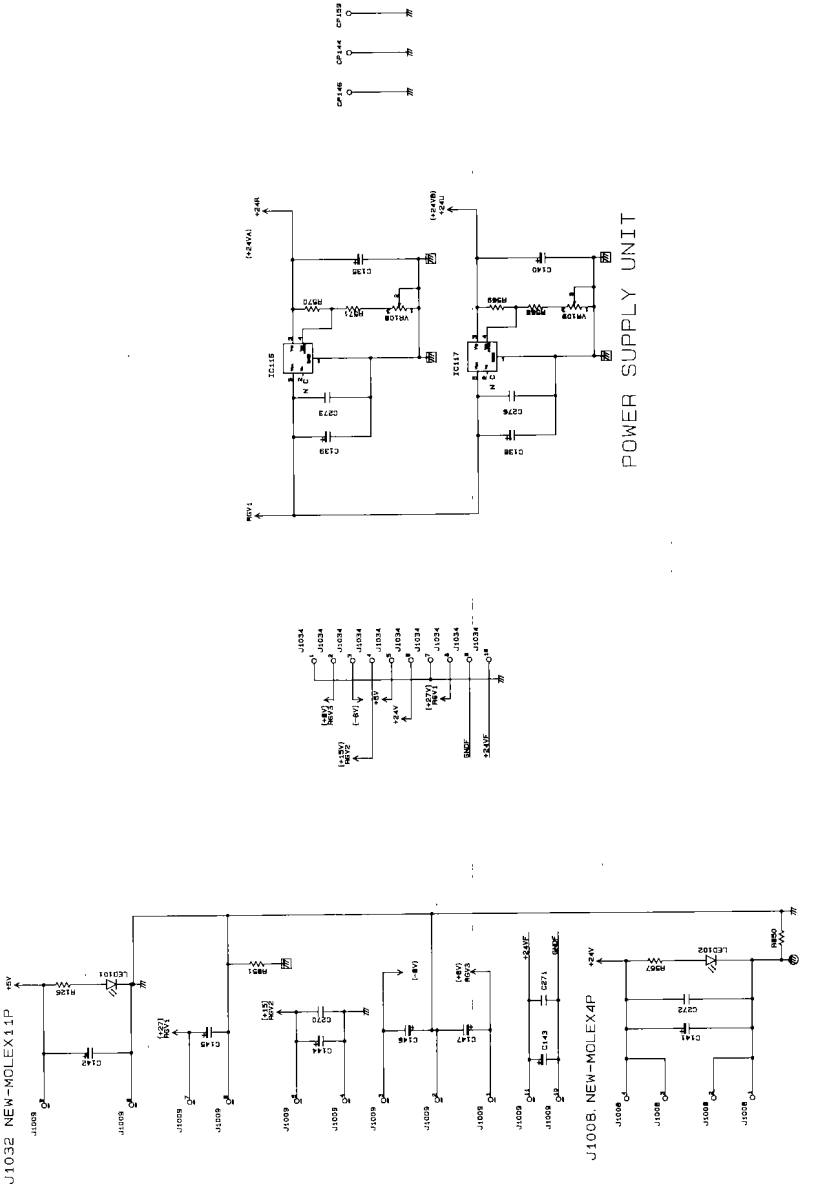
## DC controller circuit diagram (CLC700) (20/21)





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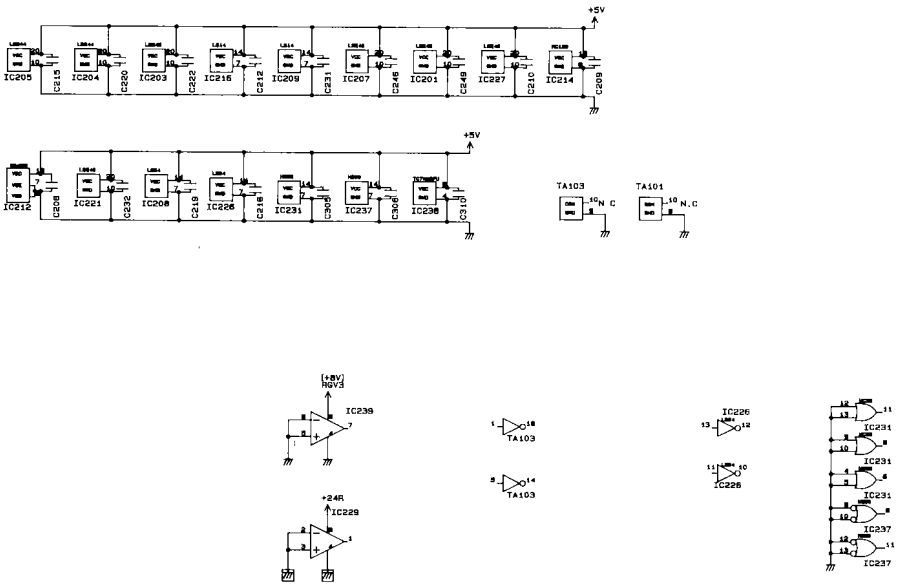
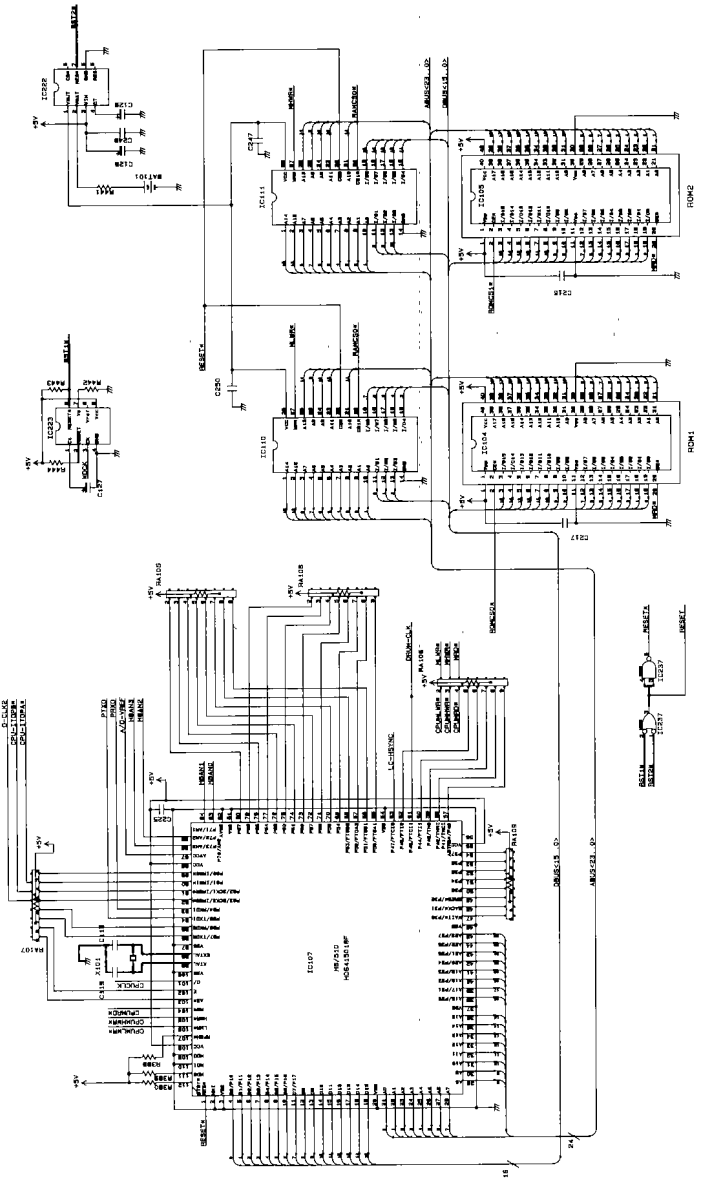
## DC controller circuit diagram (CLC700) (21/21)



## DC controller circuit diagram (CLC800) (1/22)

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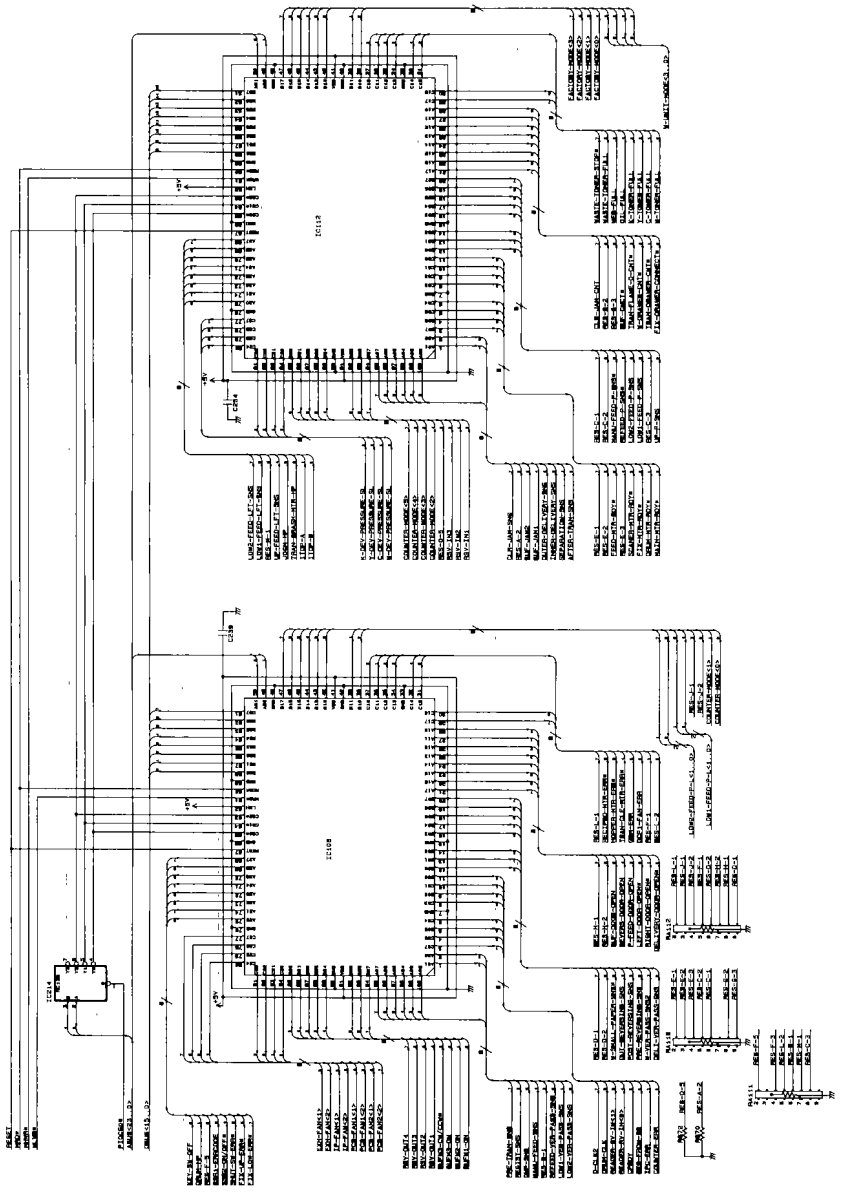
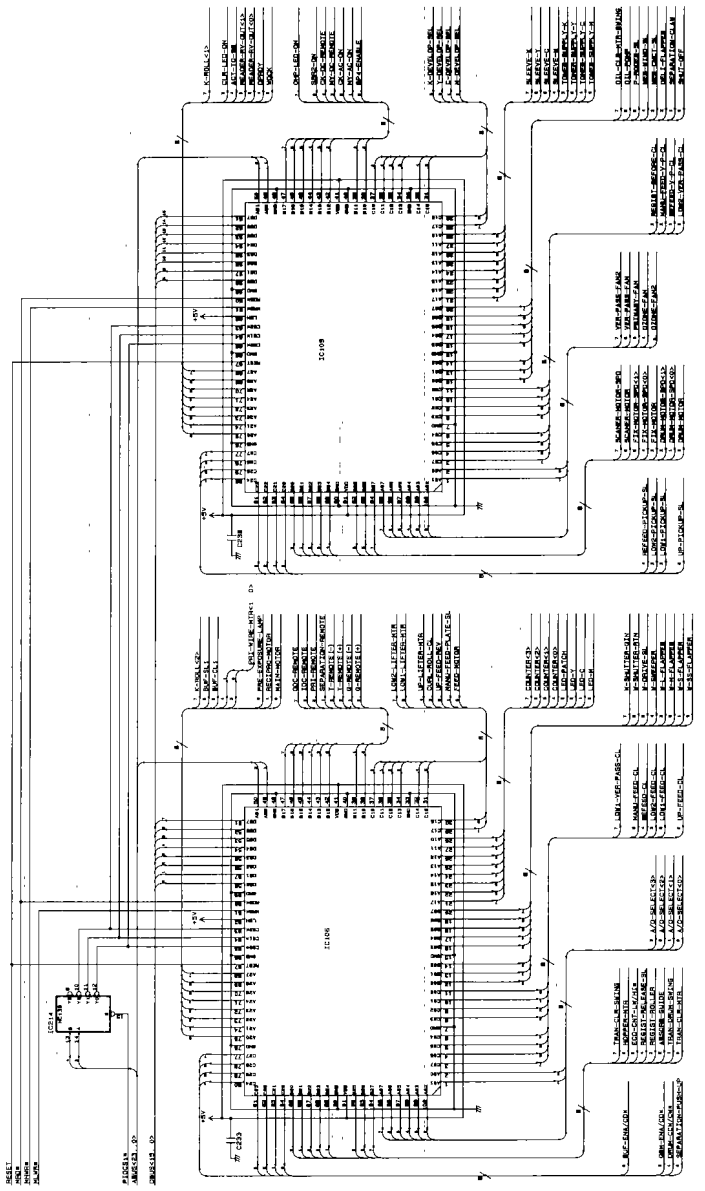
## DC controller circuit diagram (CLC800) (2/22)



## DC controller circuit diagram (CLC800) (3/22)

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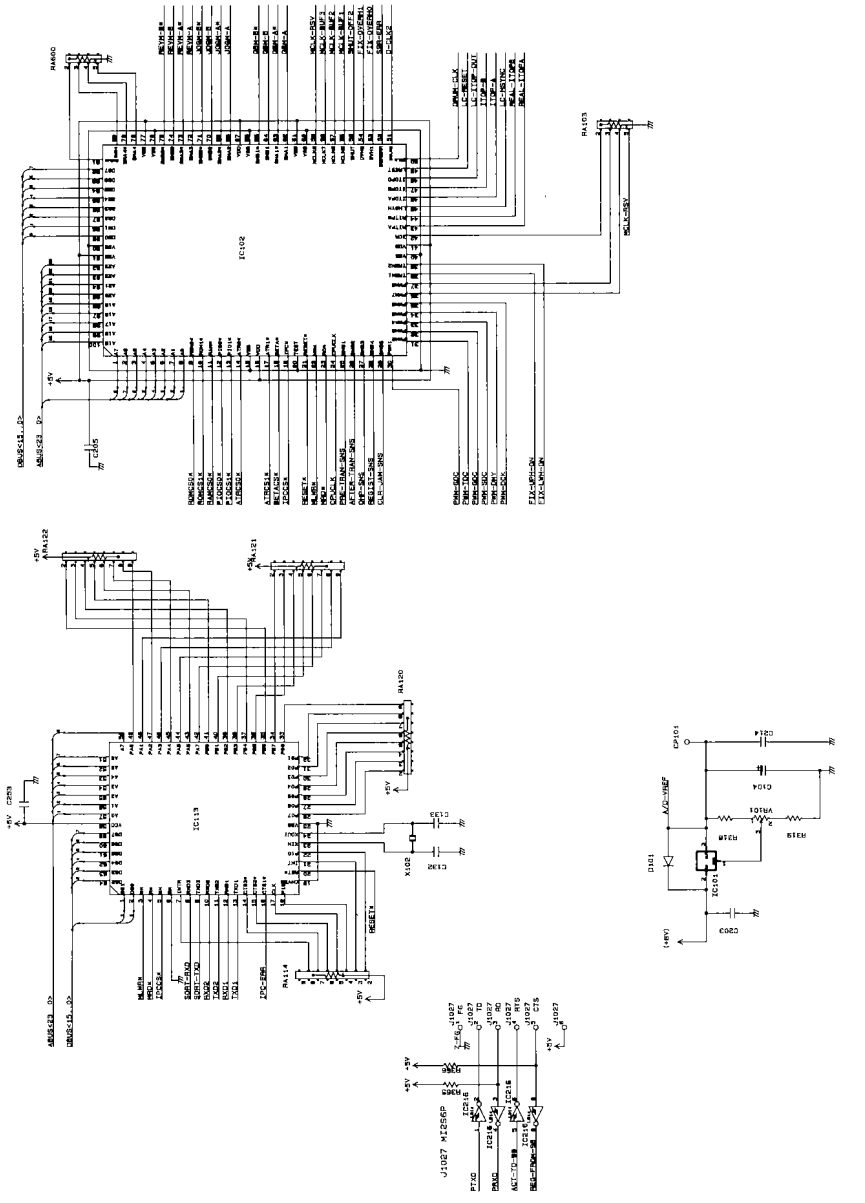
## DC controller circuit diagram (CLC800) (4/22)



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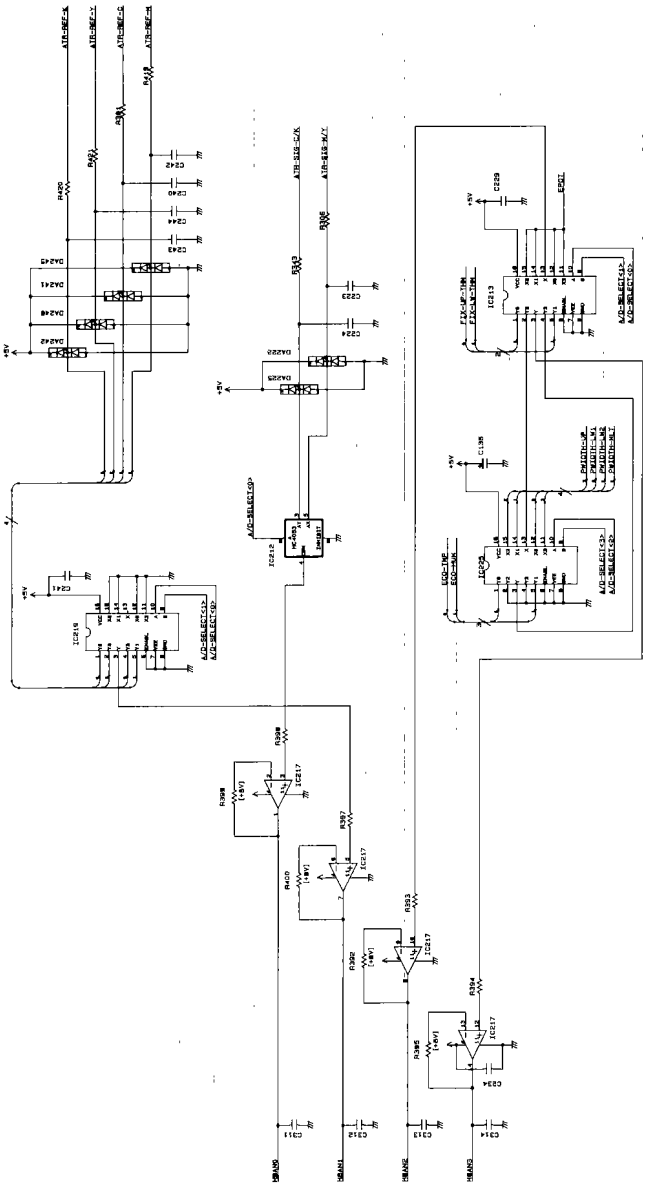
## DC controller circuit diagram (CLC800) (5/22)

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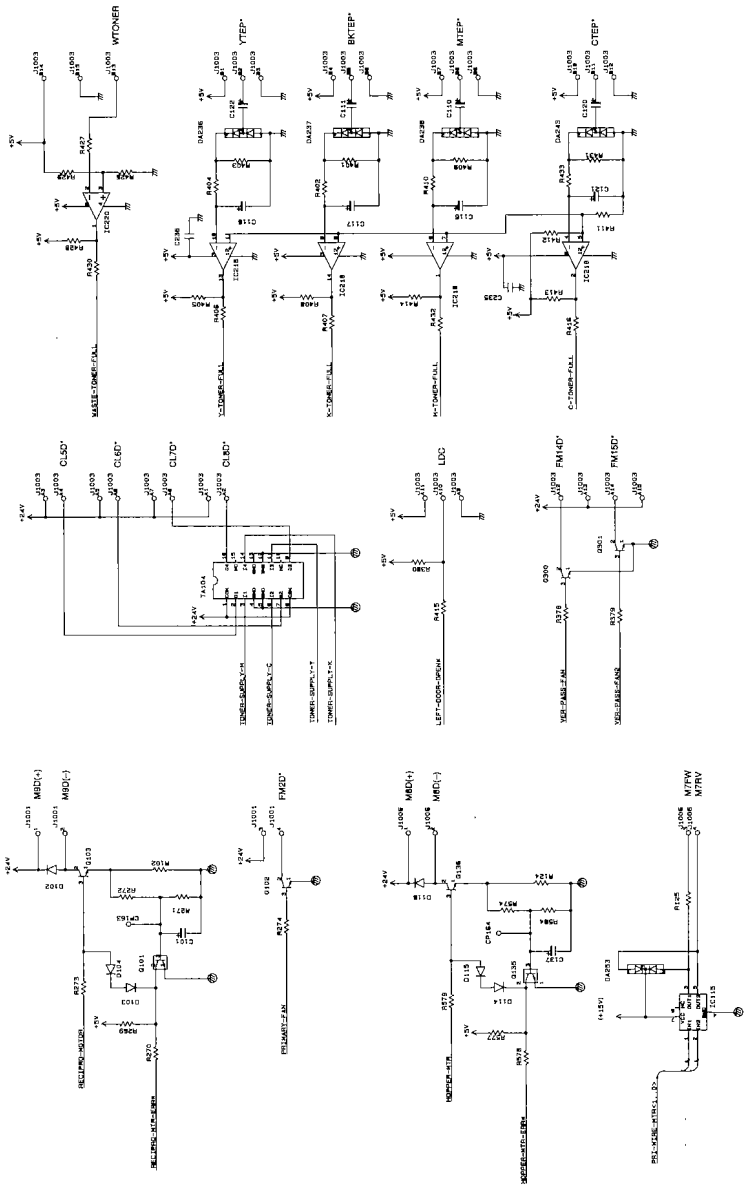
## DC controller circuit diagram (CLC800) (6/22)



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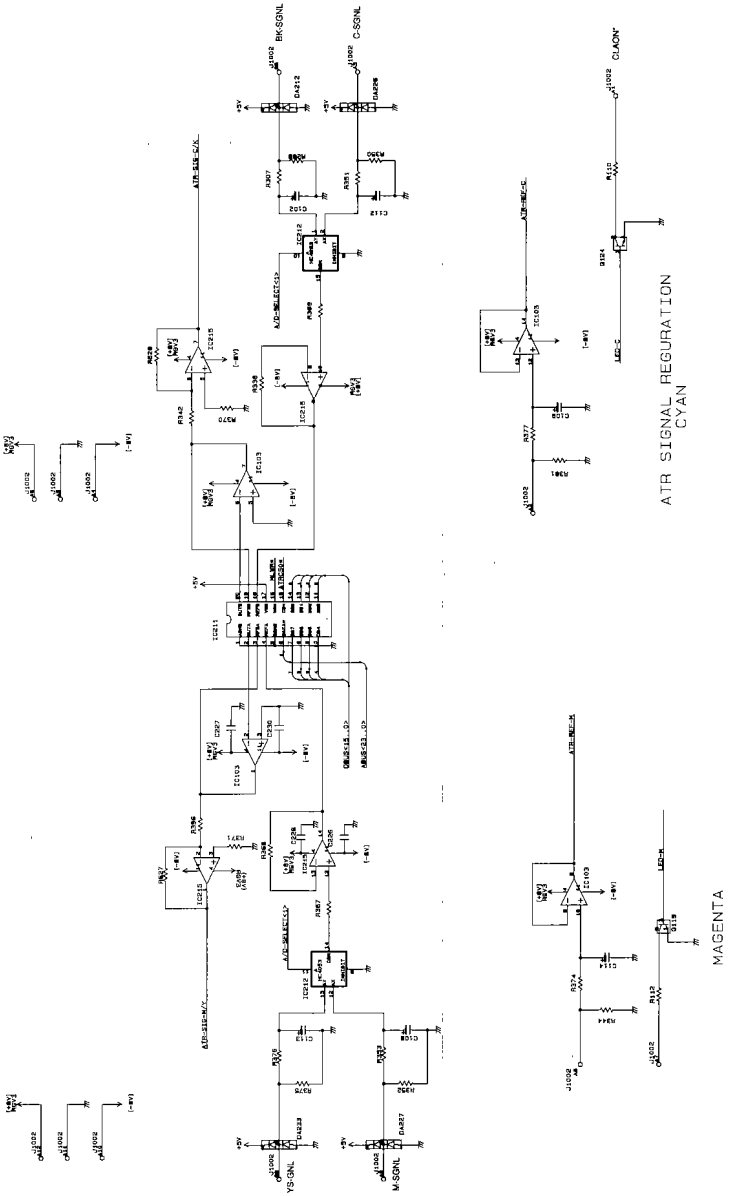
## DC controller circuit diagram (CLC800) (7/22)





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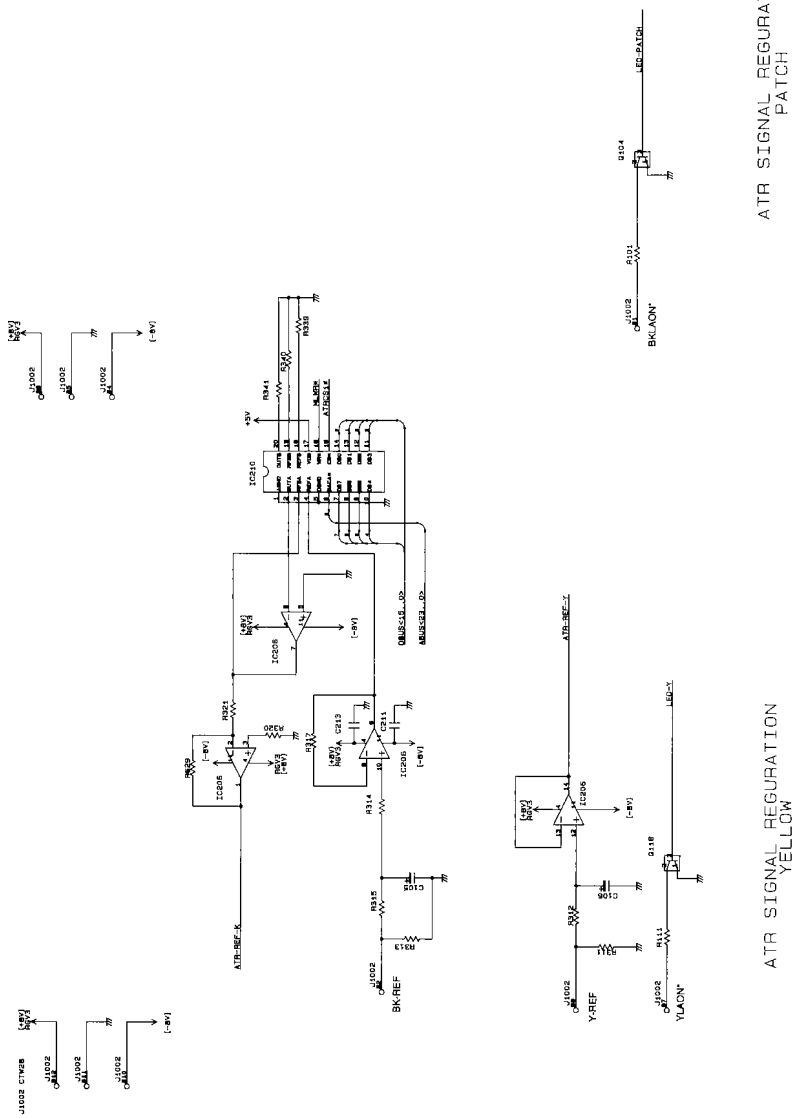
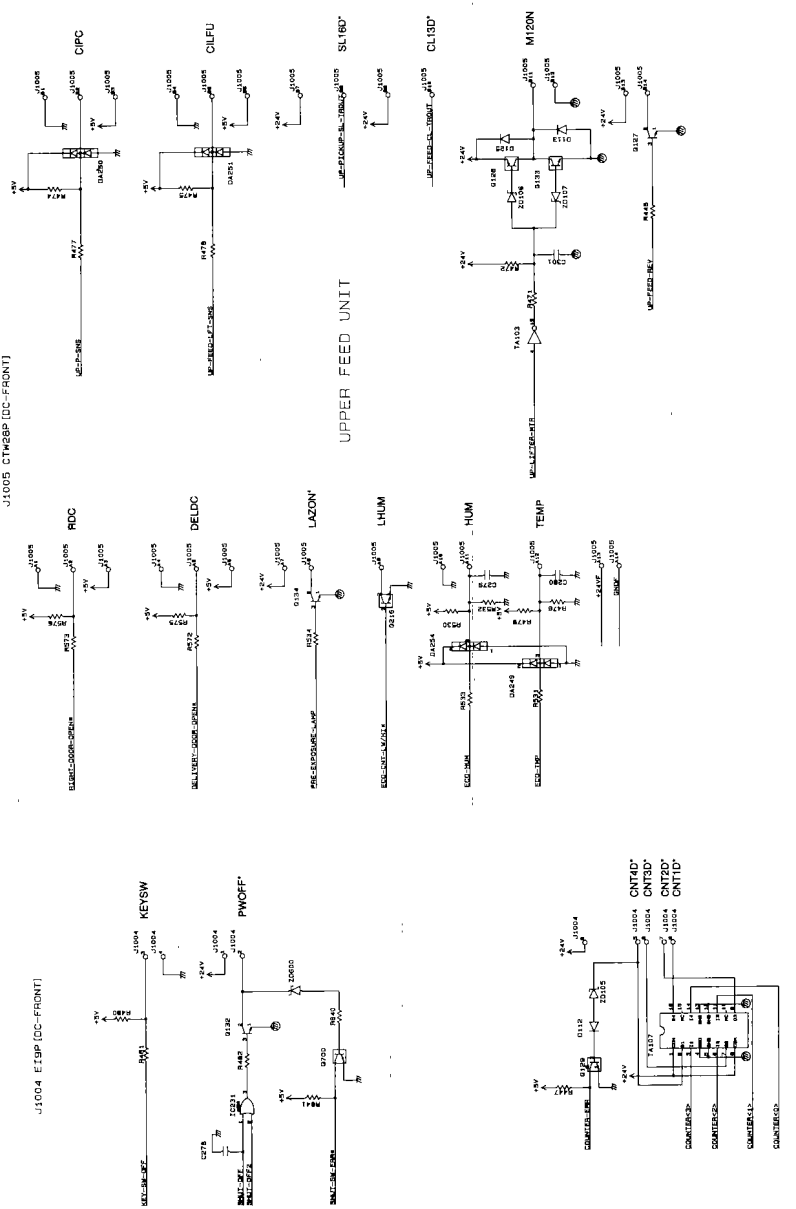
## DC controller circuit diagram (CLC800) (8/22)



## DC controller circuit diagram (CLC800) (9/22)





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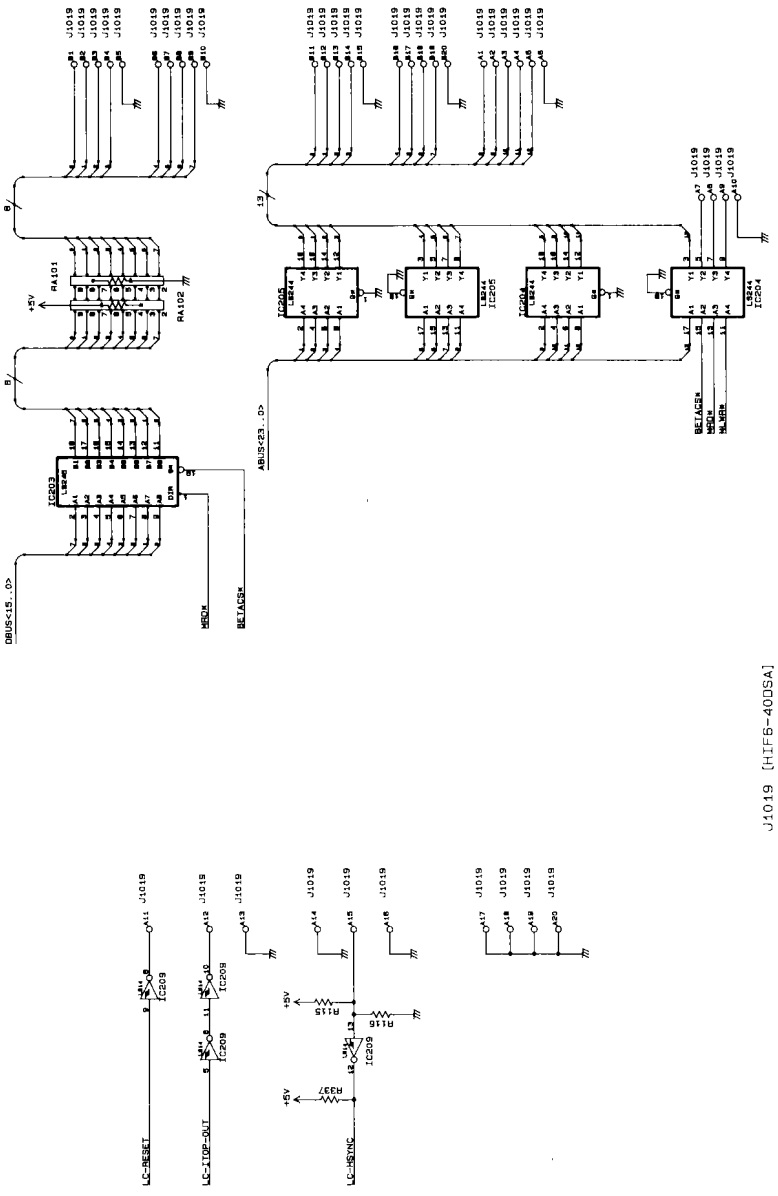
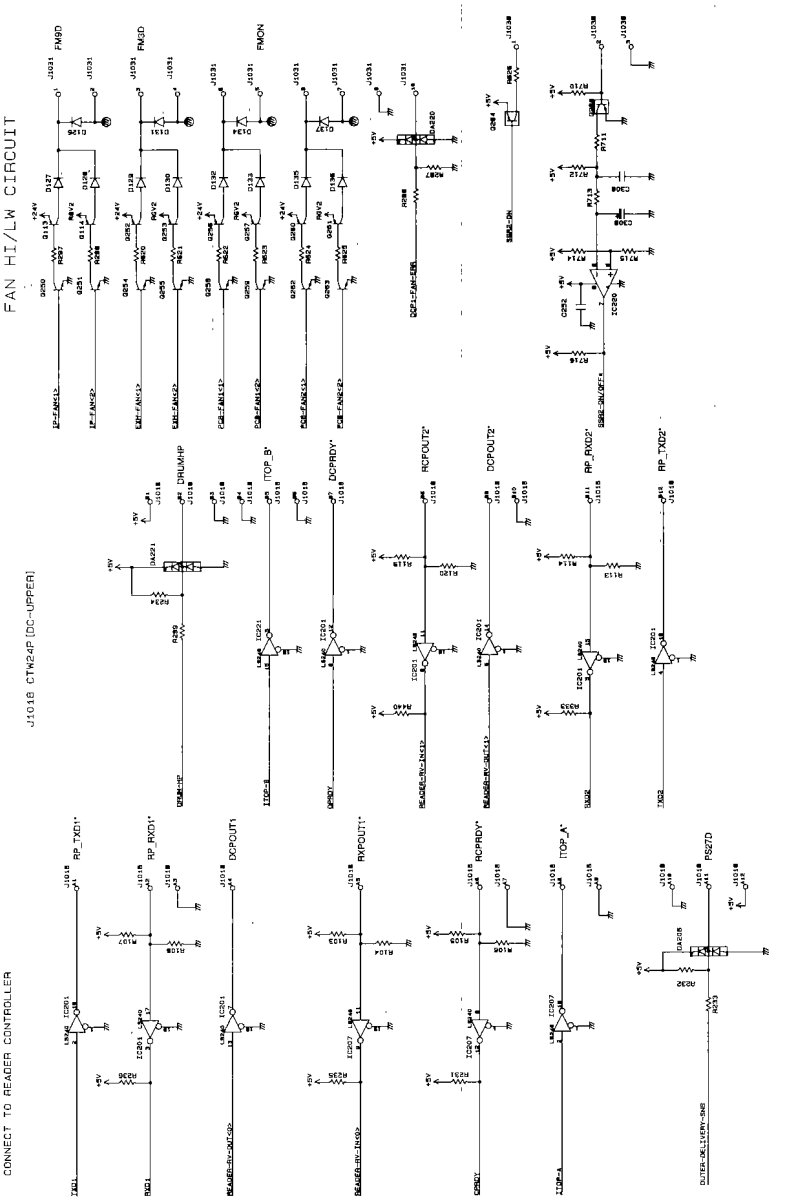
## DC controller circuit diagram (CLC800) (10/22)



## DC controller circuit diagram (CLC800) (11/22)





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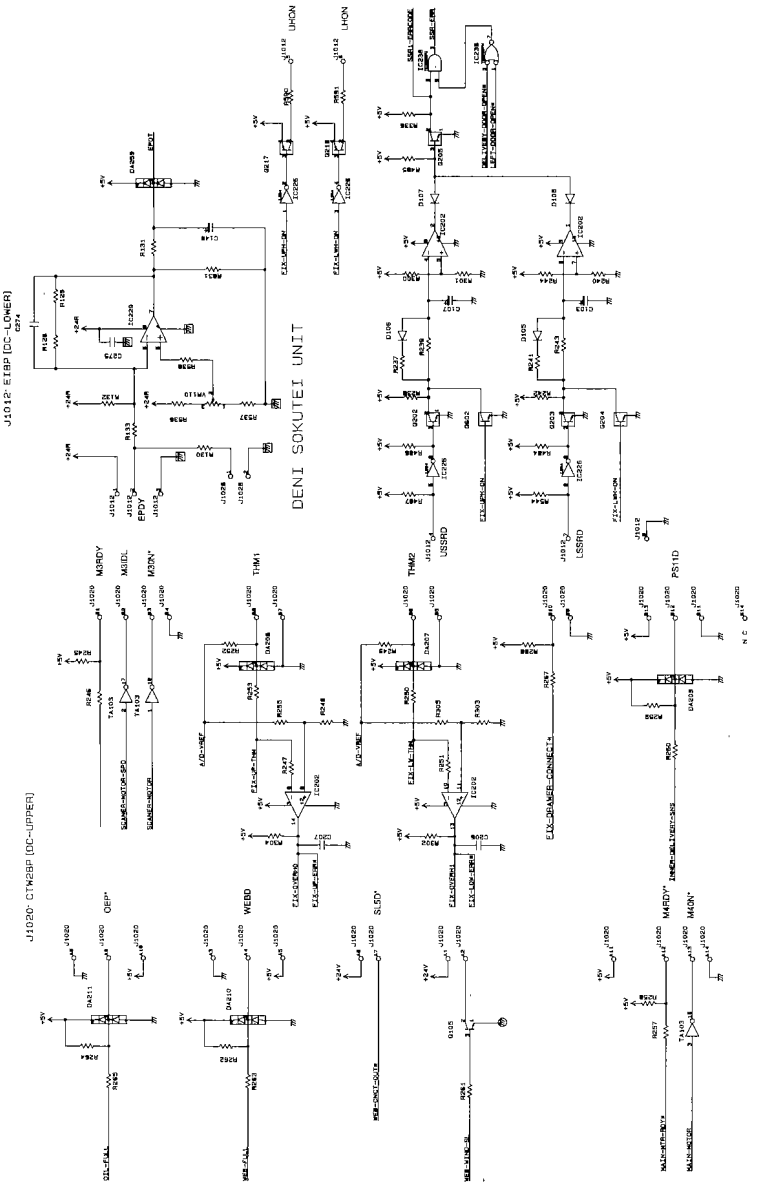
## DC controller circuit diagram (CLC800) (12/22)

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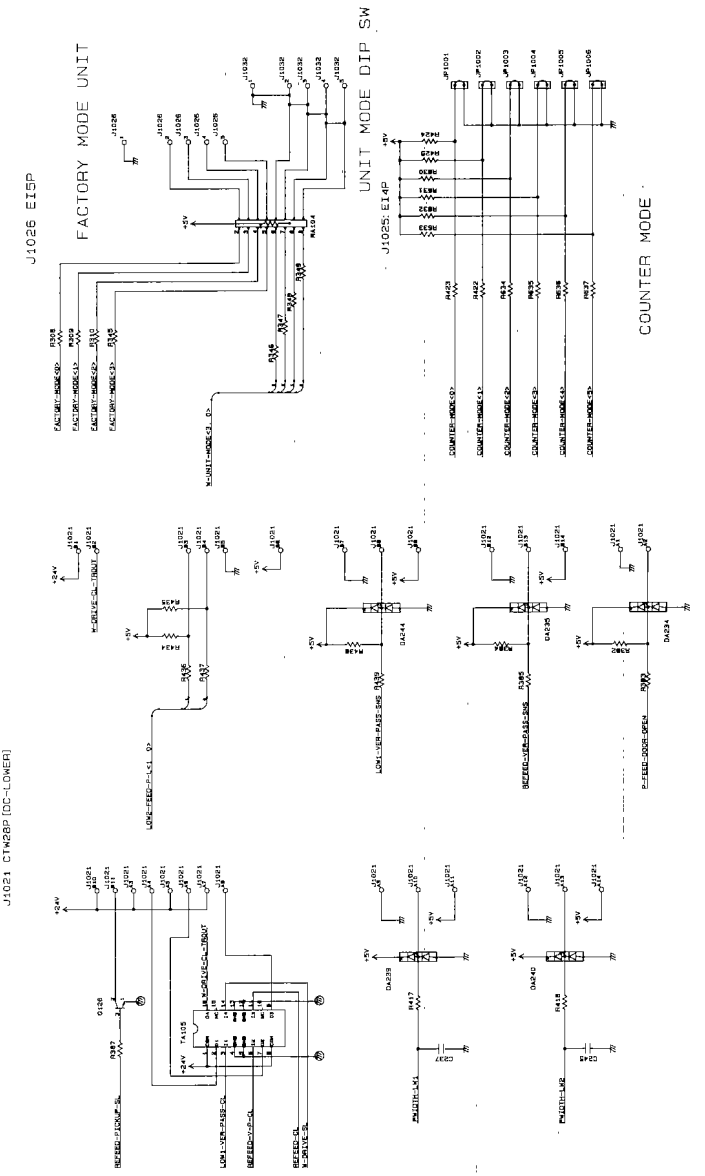
## DC controller circuit diagram (CLC800) (13/22)





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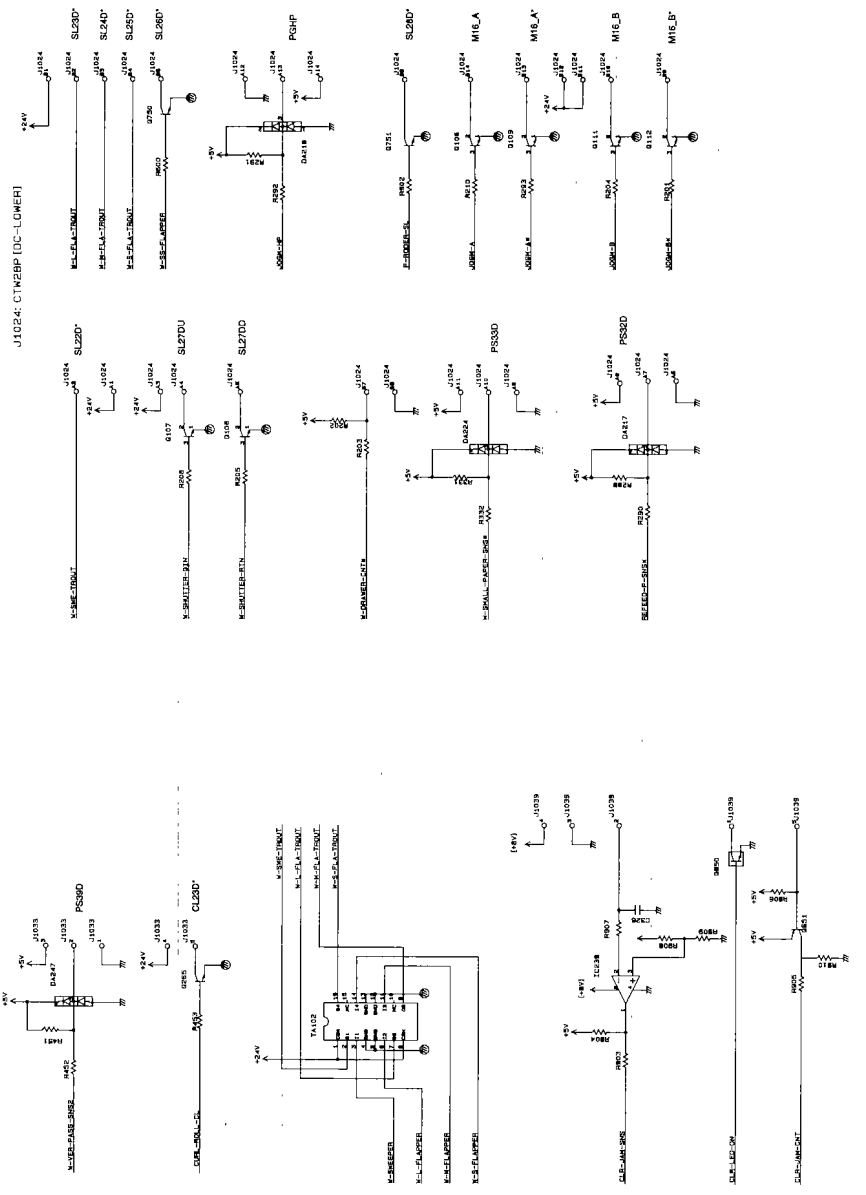
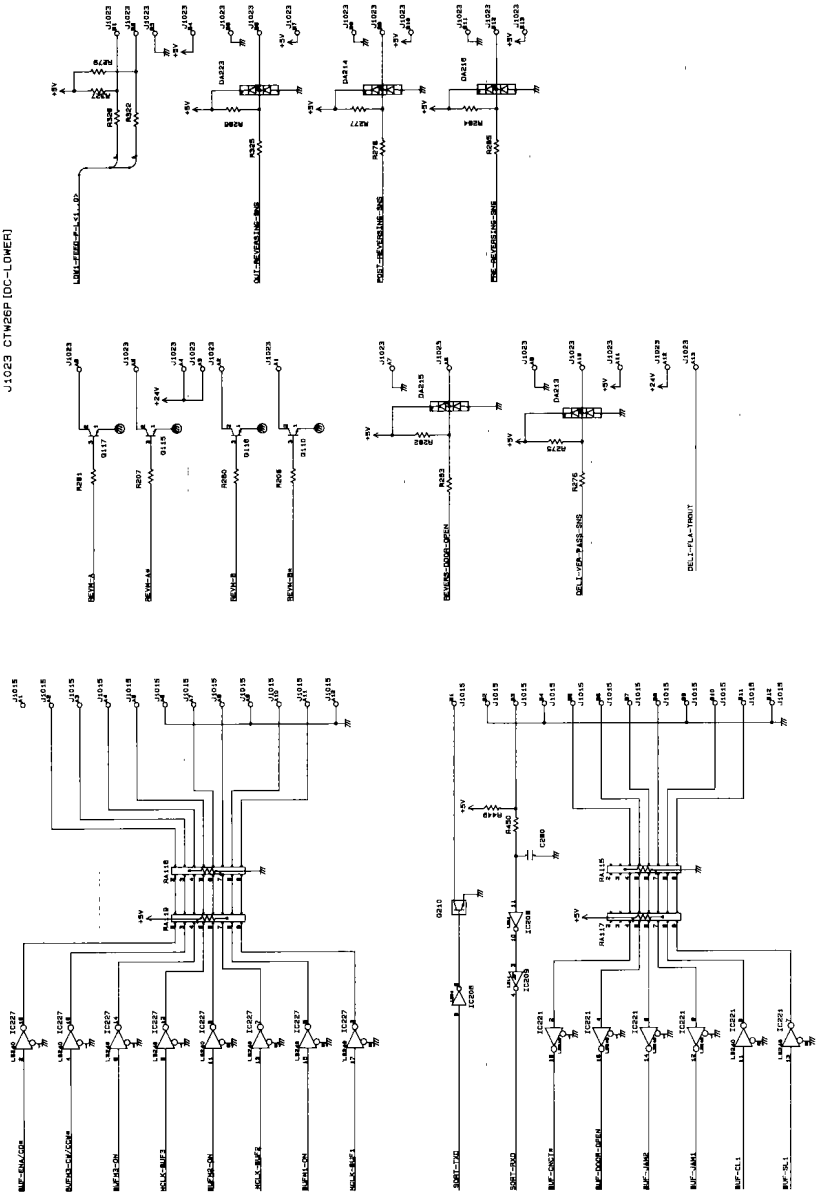
## DC controller circuit diagram (CLC800) (14/22)



## DC controller circuit diagram (CLC800) (15/22)





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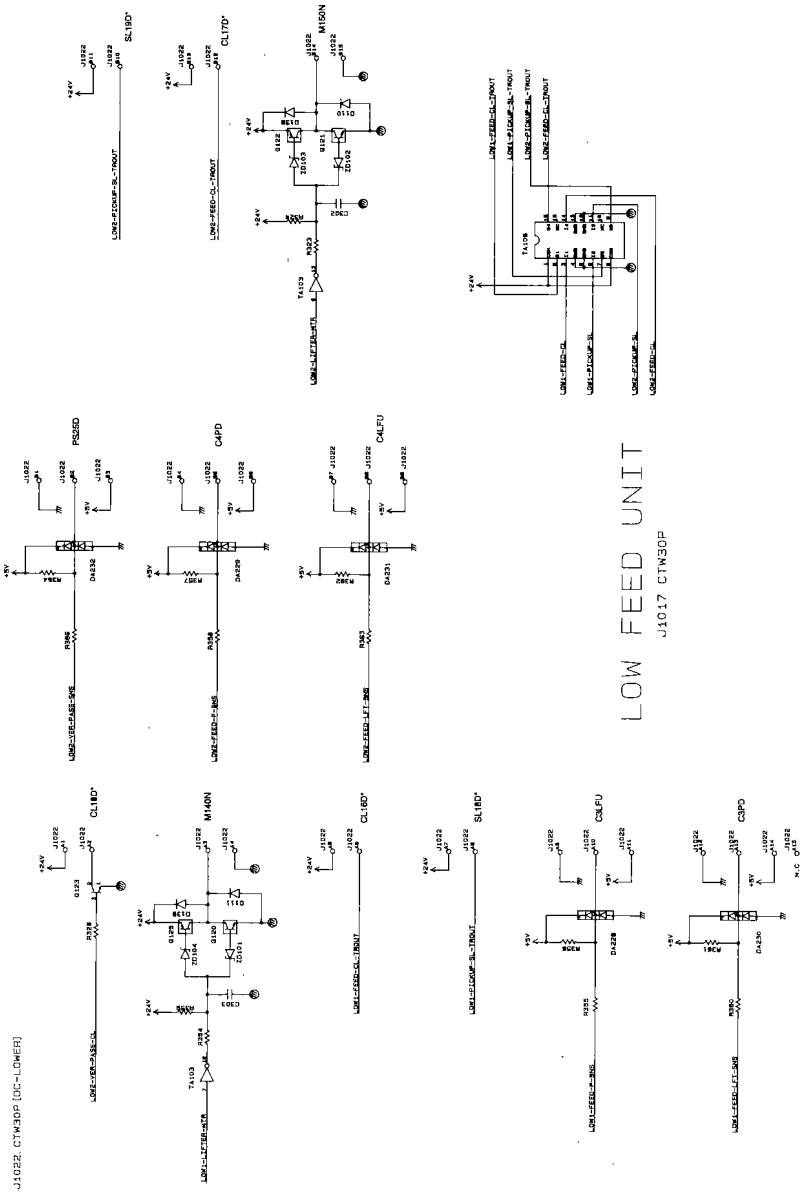
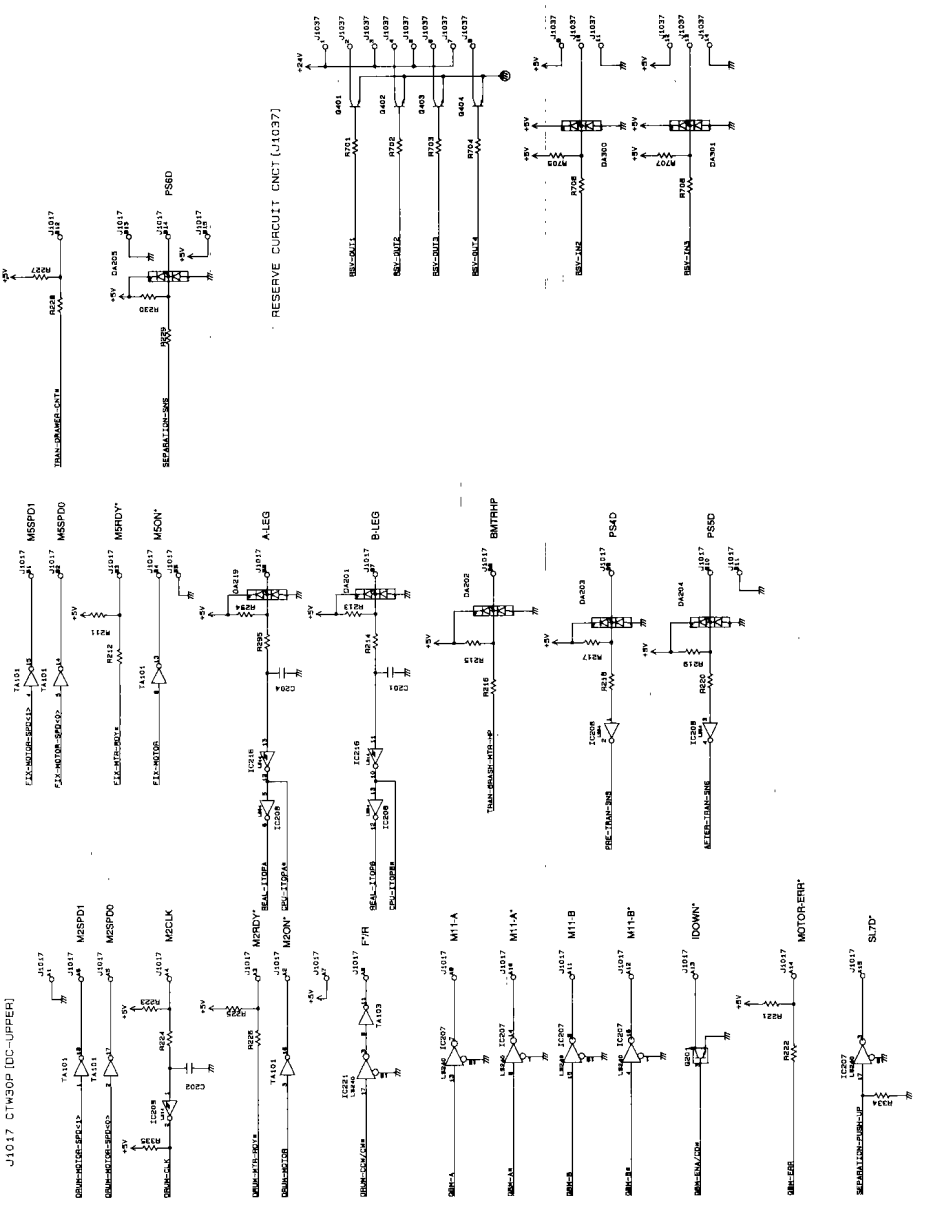
## DC controller circuit diagram (CLC800) (16/22)



## DC controller circuit diagram (CLC800) (17/22)





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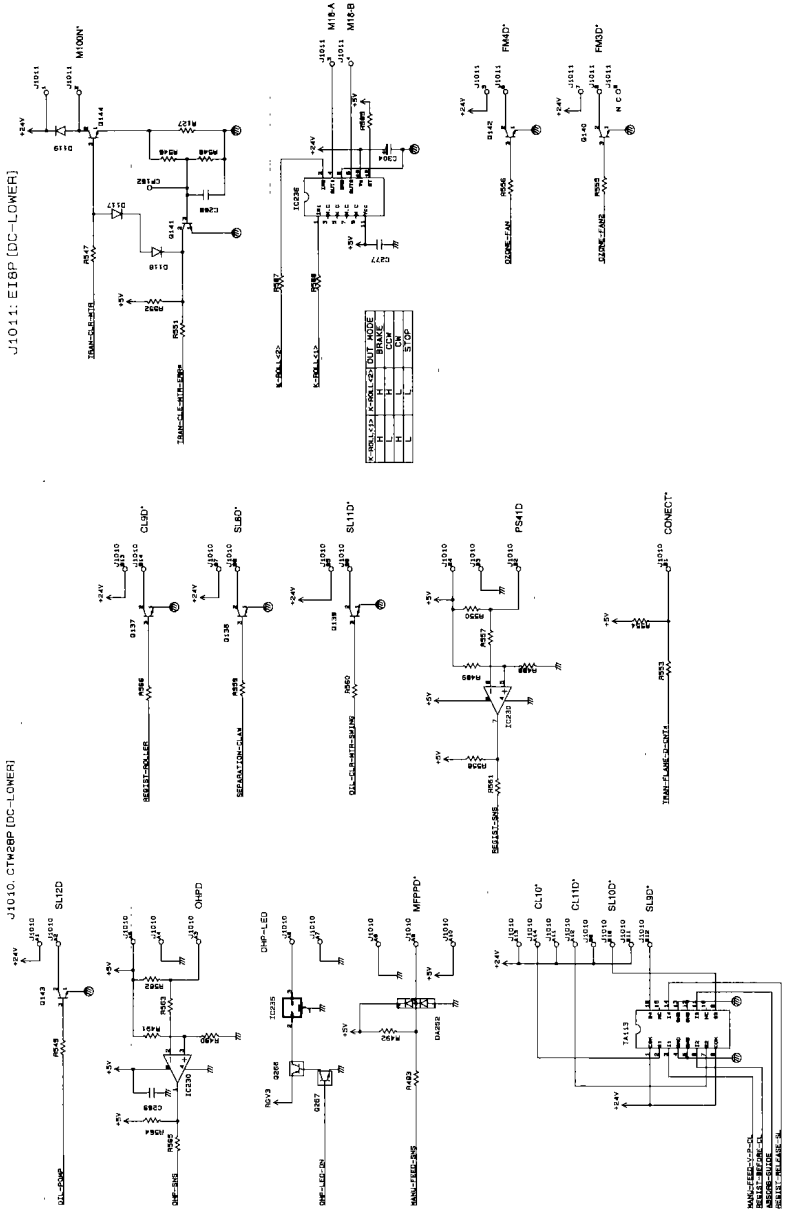
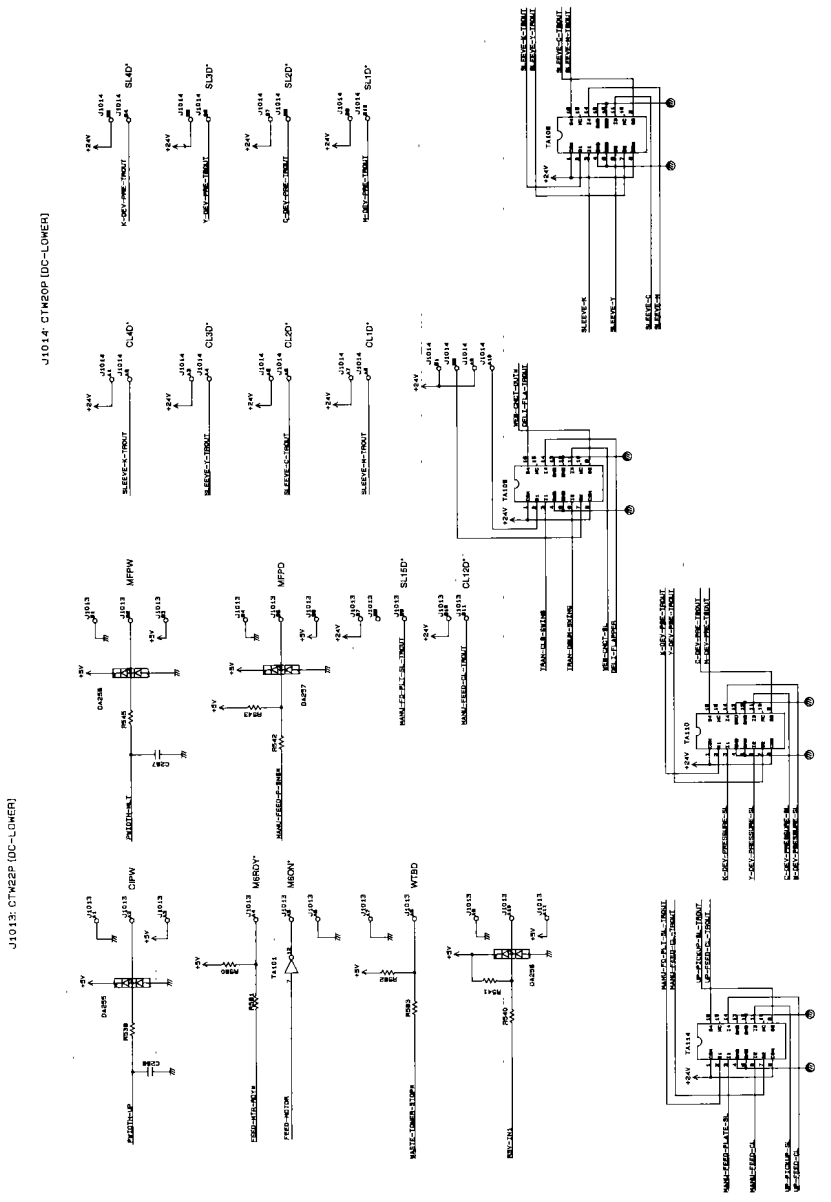
## DC controller circuit diagram (CLC800) (18/22)



## DC controller circuit diagram (CLC800) (19/22)

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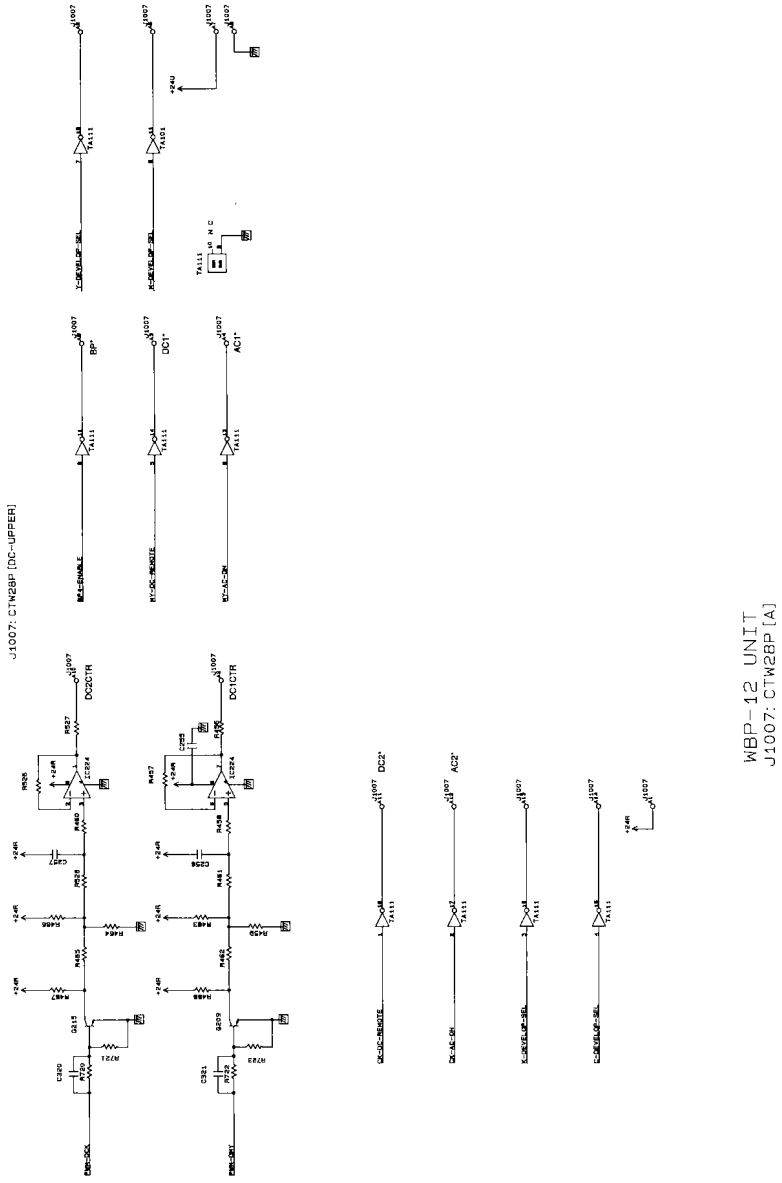
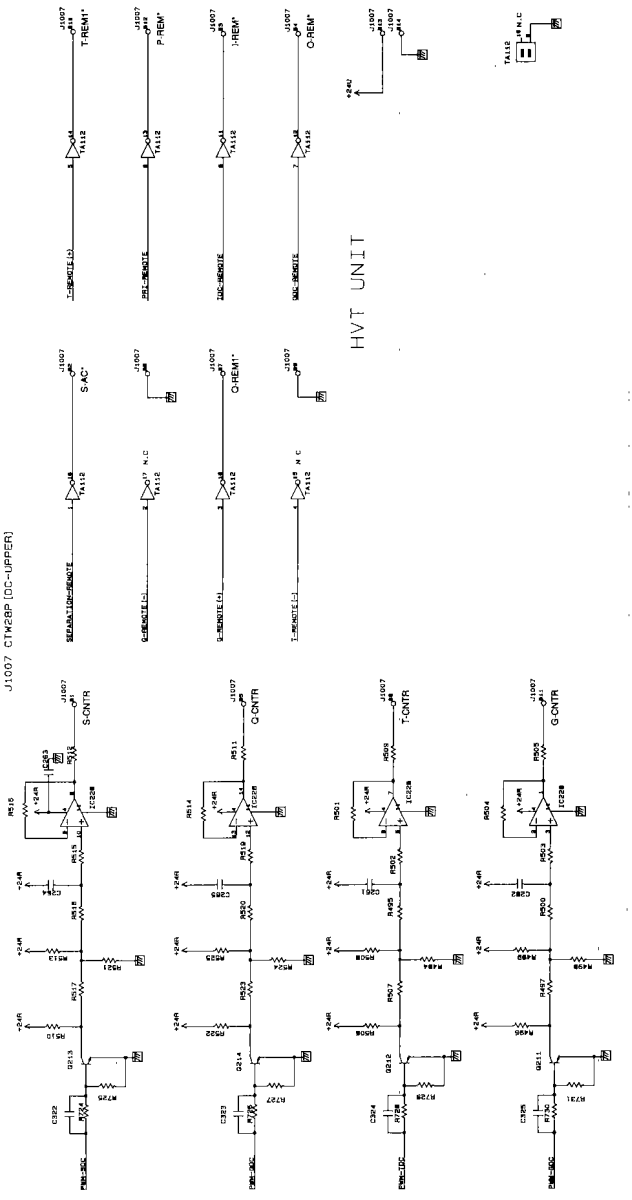
## DC controller circuit diagram (CLC800) (20/22)



## DC controller circuit diagram (CLC800) (21/22)





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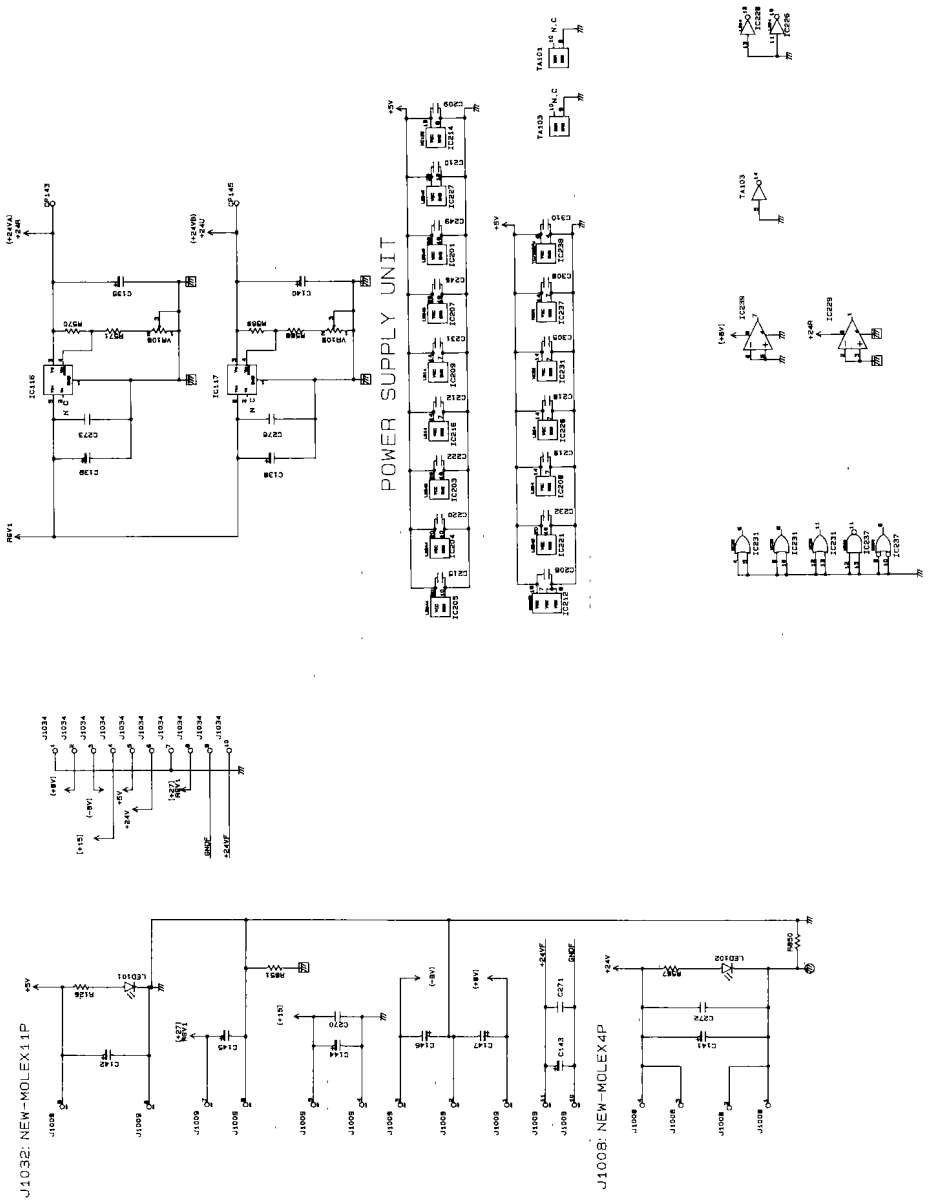
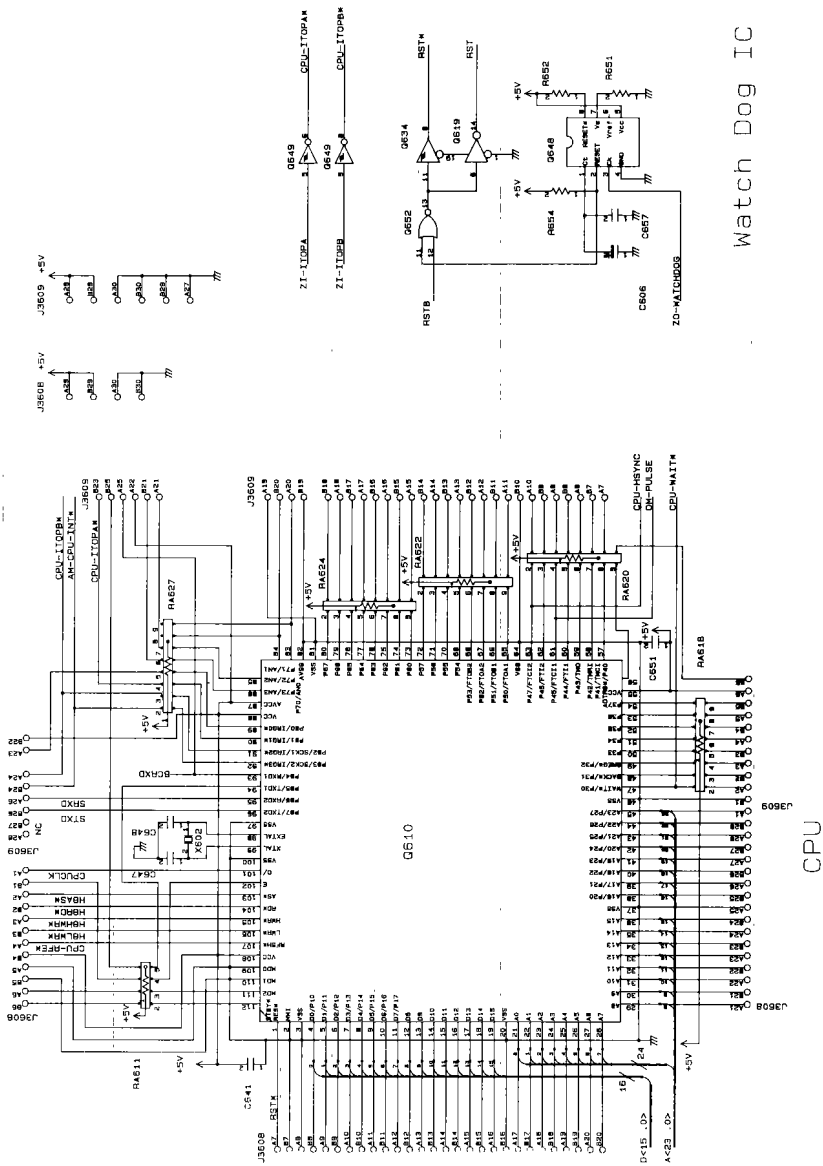
## DC controller circuit diagram (CLC800) (22/22)



# E. READER CONTROLLER CIRCUIT DIAGRAM

## Reader controller circuit diagram (1/13)





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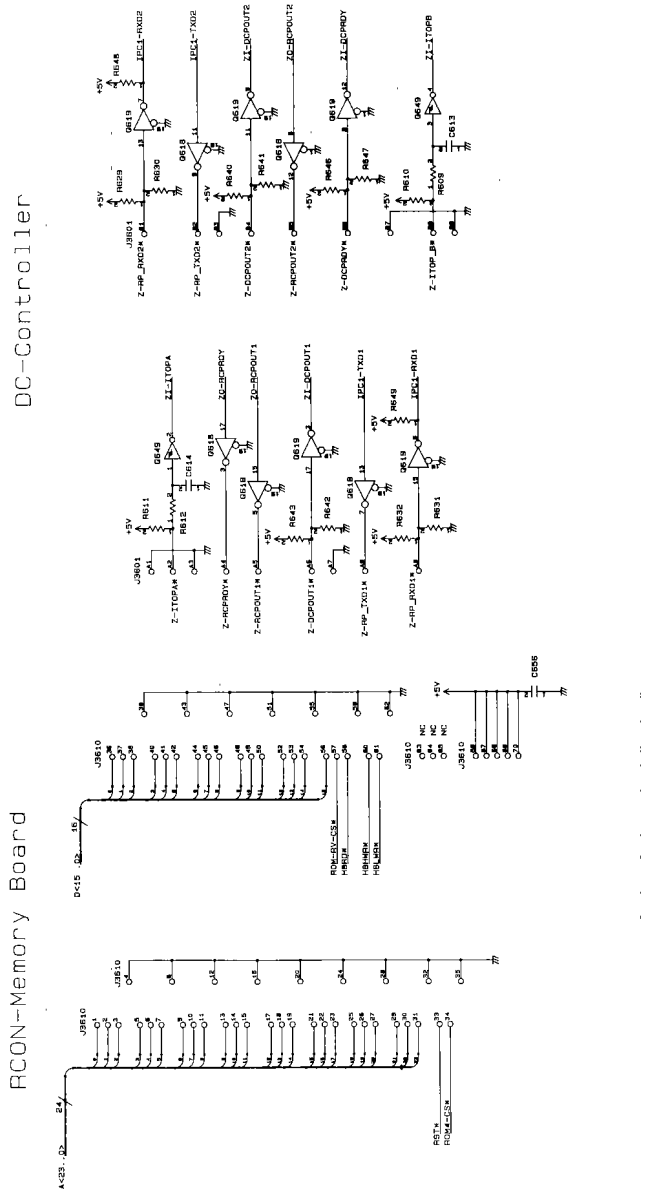
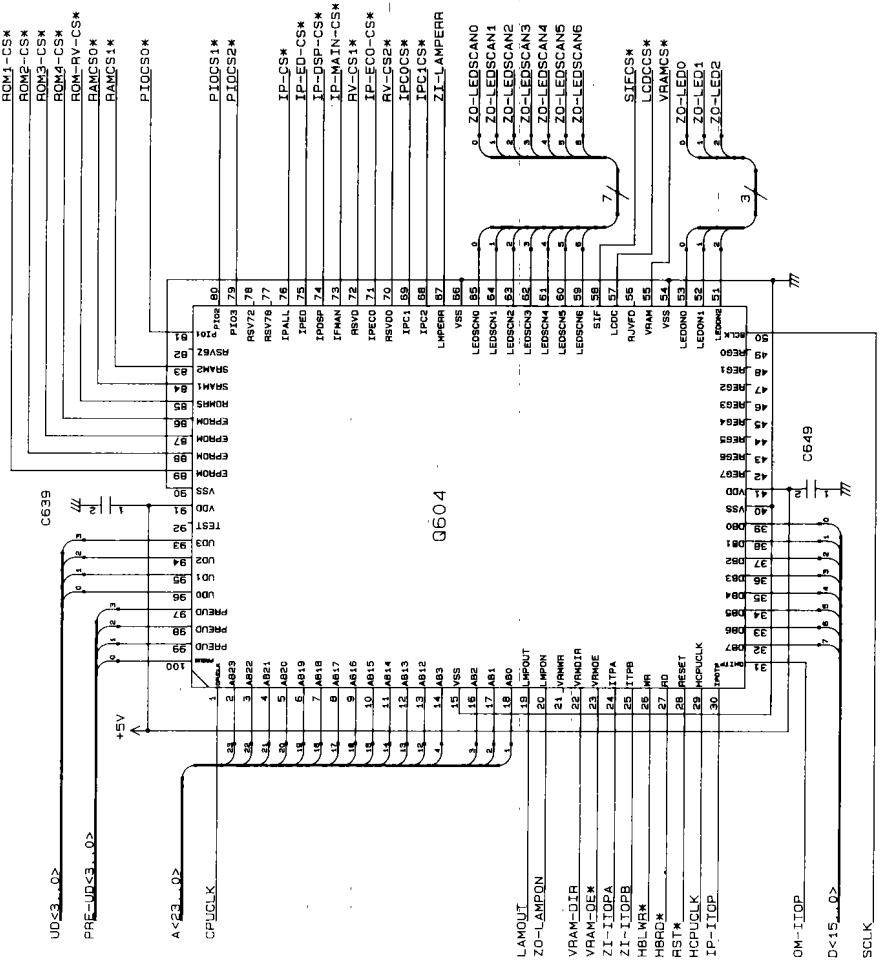
## Reader controller circuit diagram (2/13)



## Reader controller circuit diagram (3/13)





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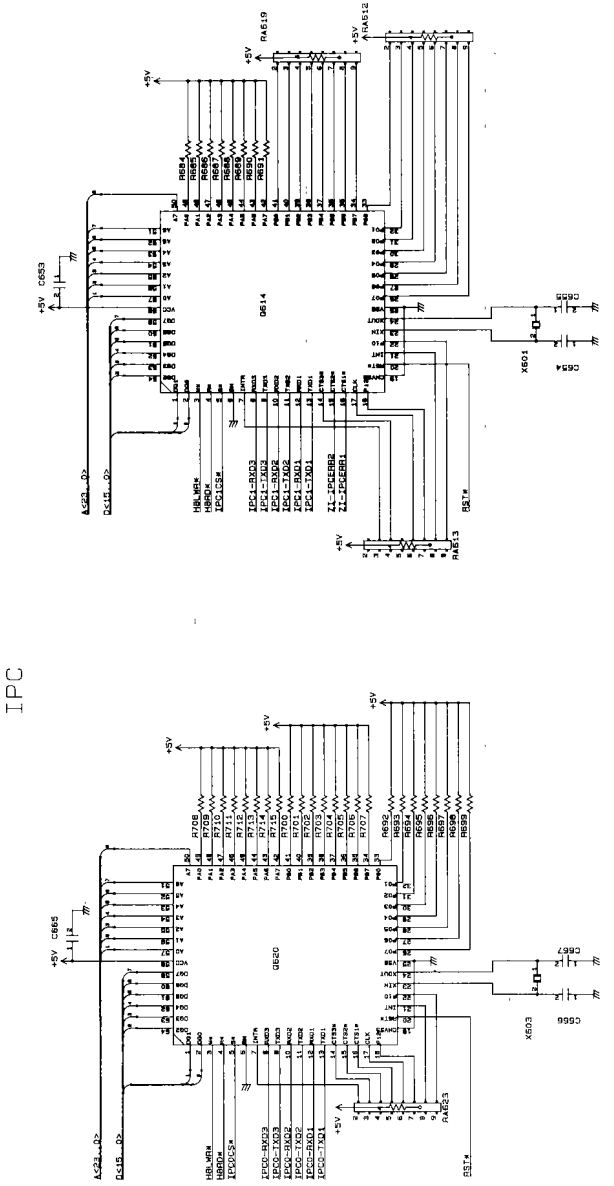
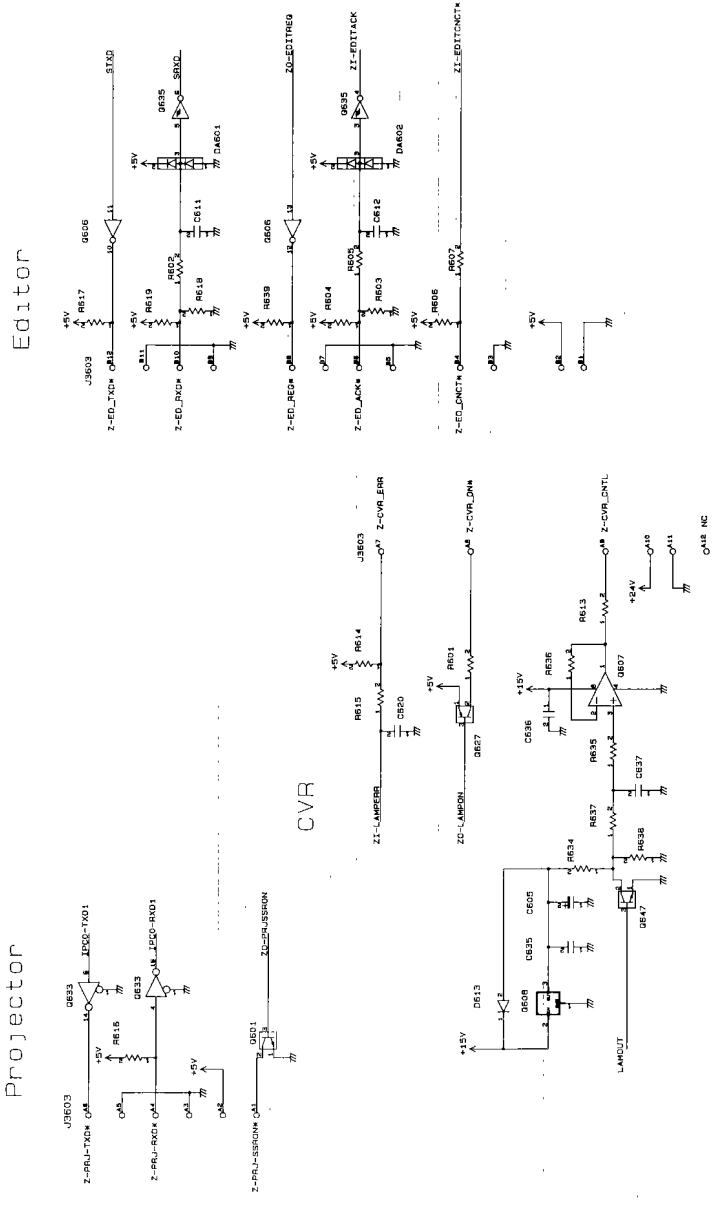
## Reader controller circuit diagram (4/13)



## Reader controller circuit diagram (5/13)





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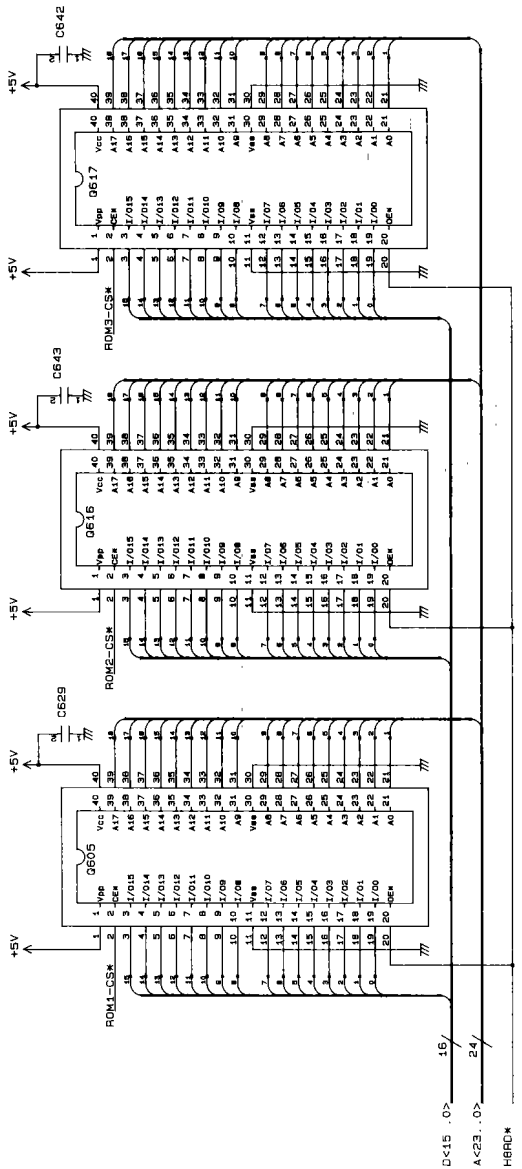
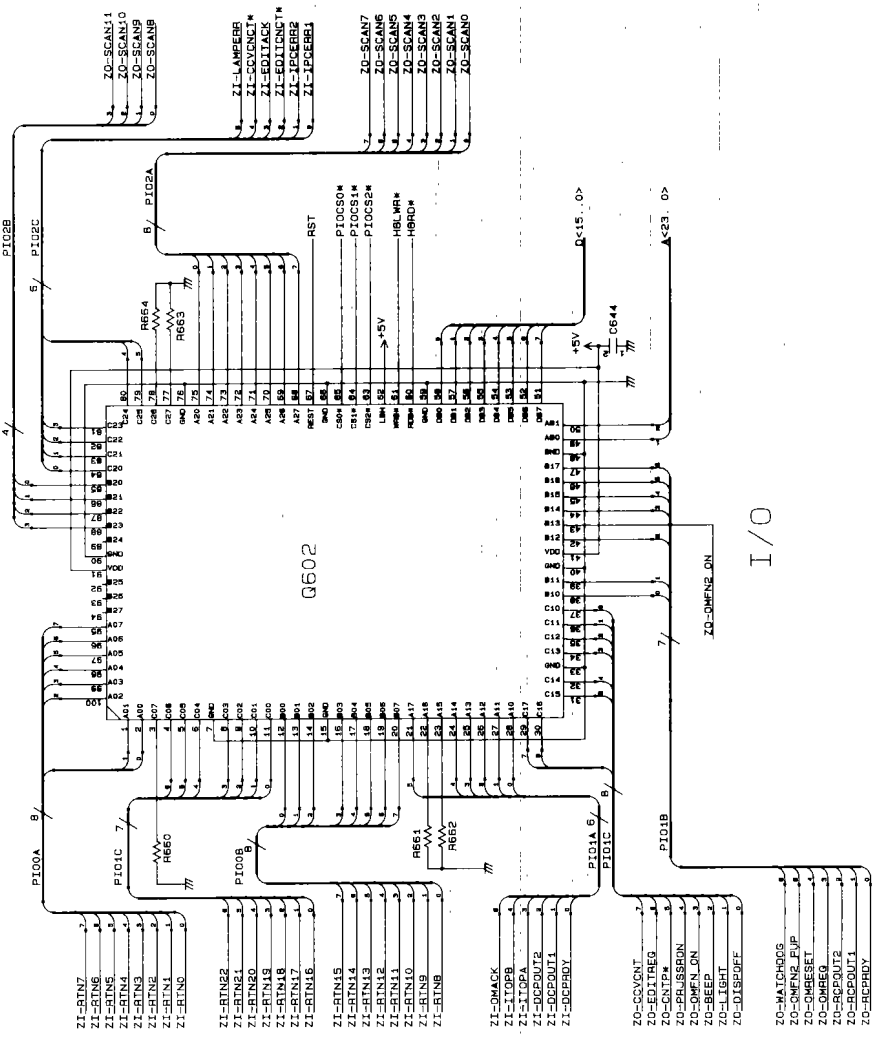
## Reader controller circuit diagram (6/13)



## Reader controller circuit diagram (7/13)





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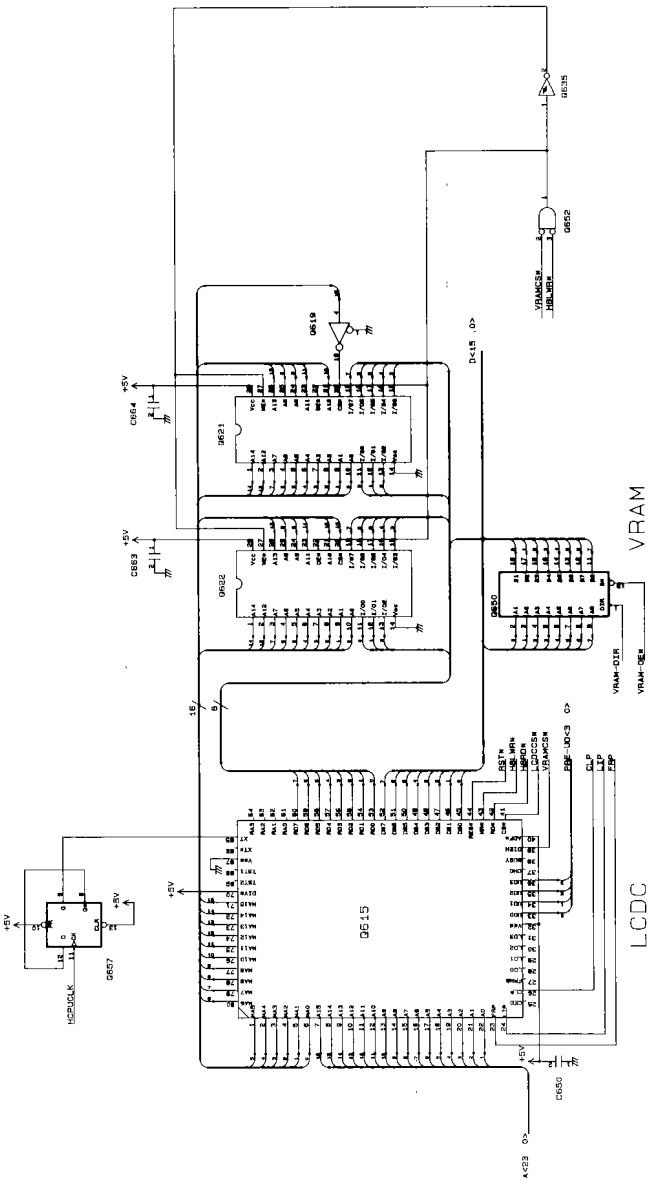
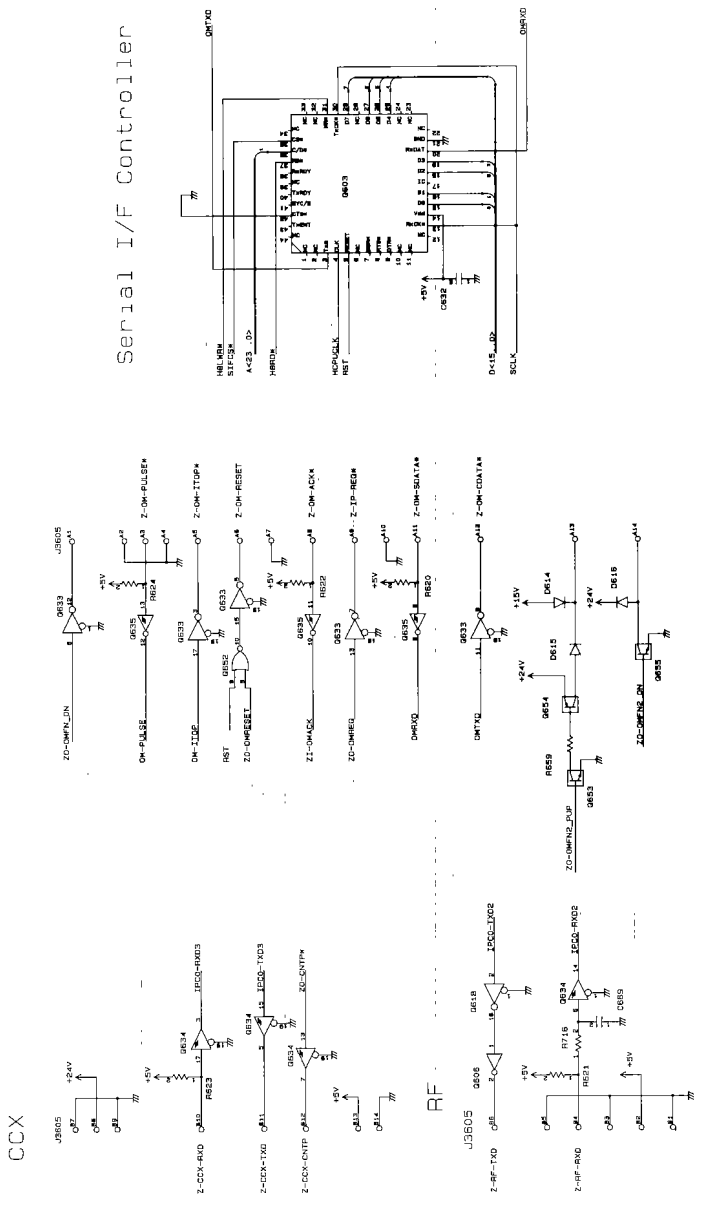
## Reader controller circuit diagram (8/13)



## Reader controller circuit diagram (9/13)





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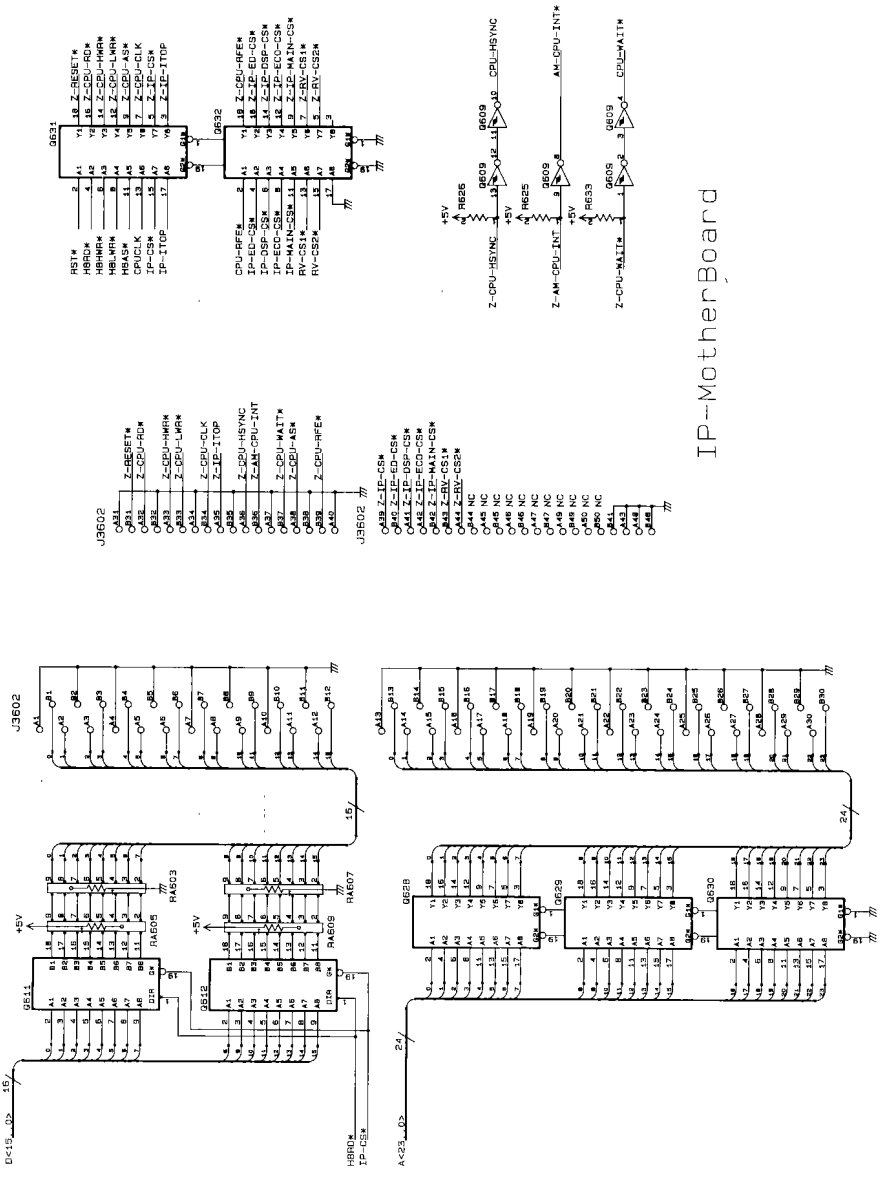
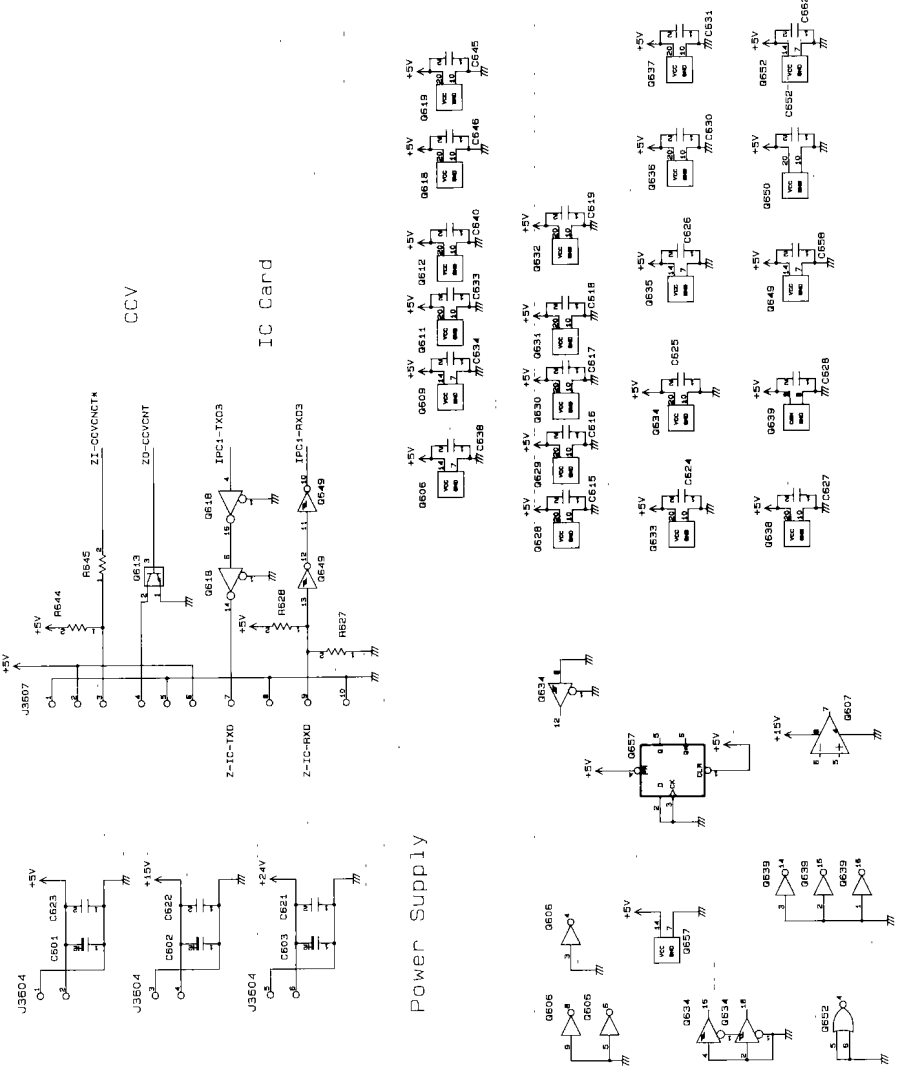
## Reader controller circuit diagram (10/13)



## Reader controller circuit diagram (11/13)





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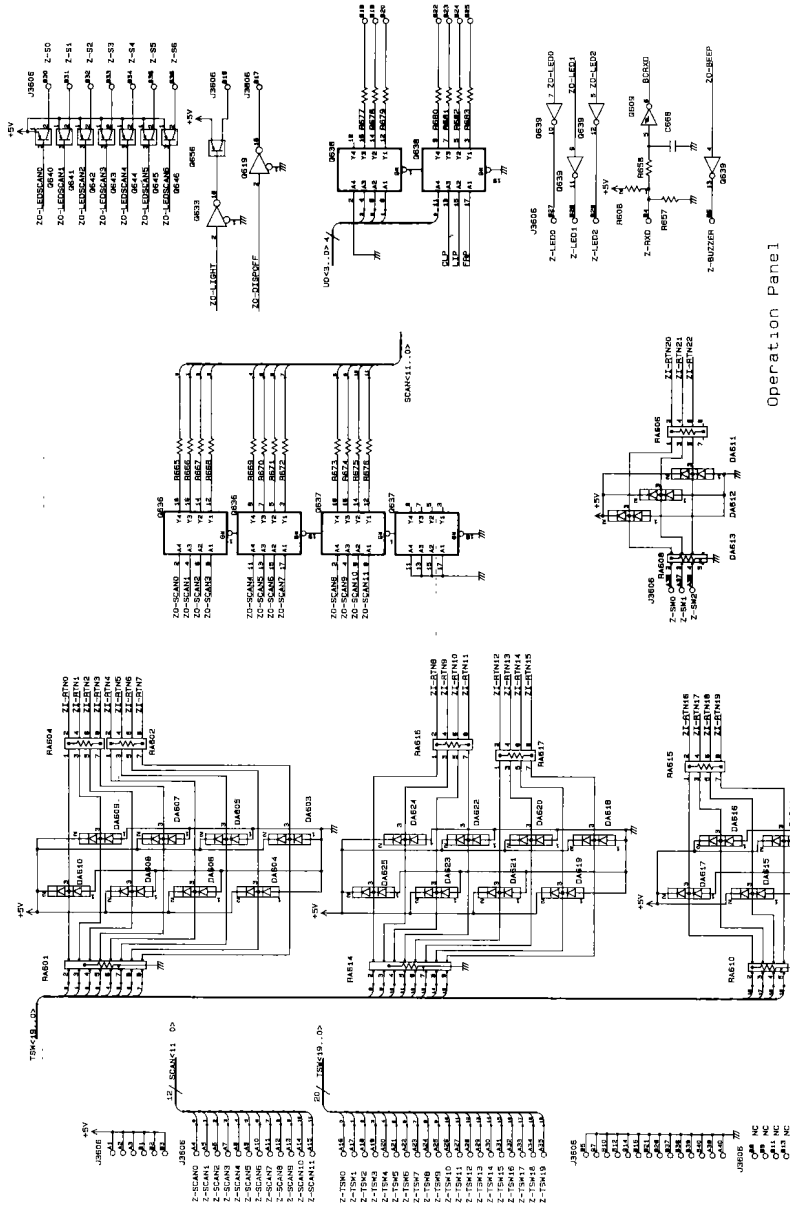
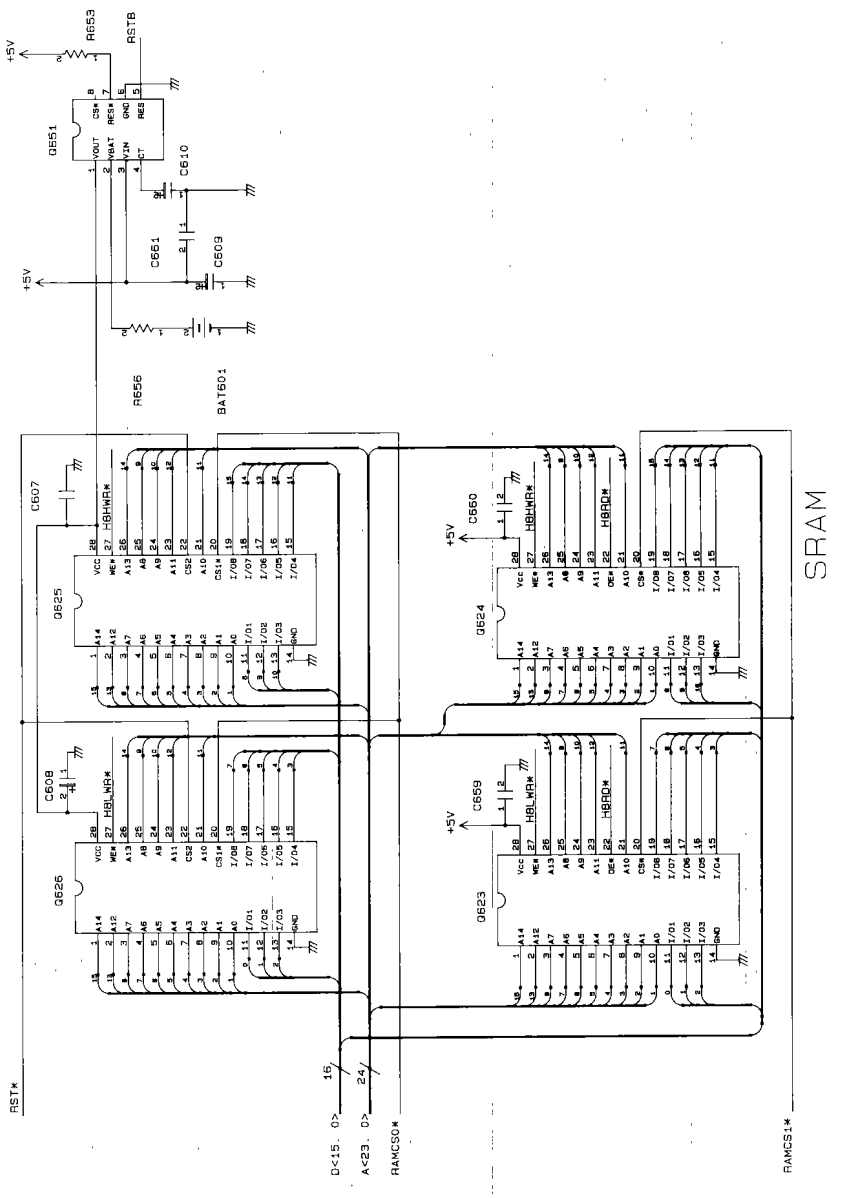
## Reader controller circuit diagram (12/13)



## Reader controller circuit diagram (13/13)





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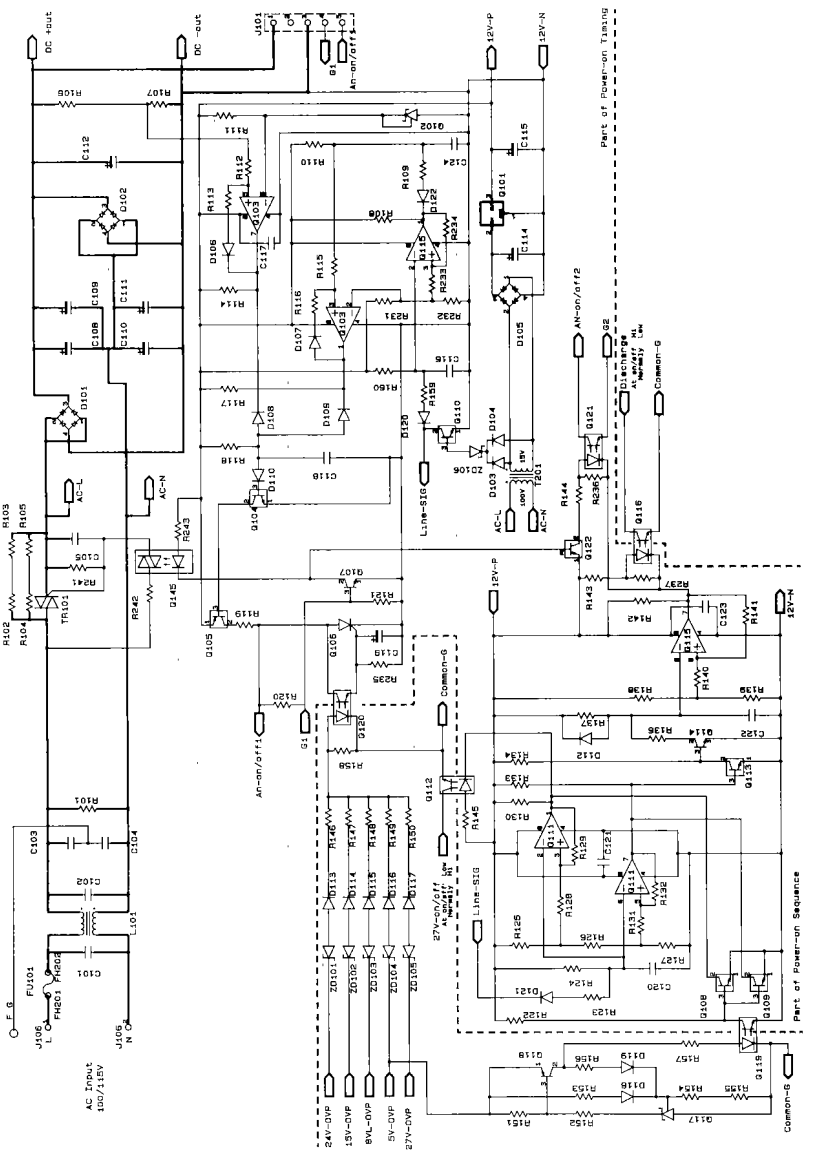
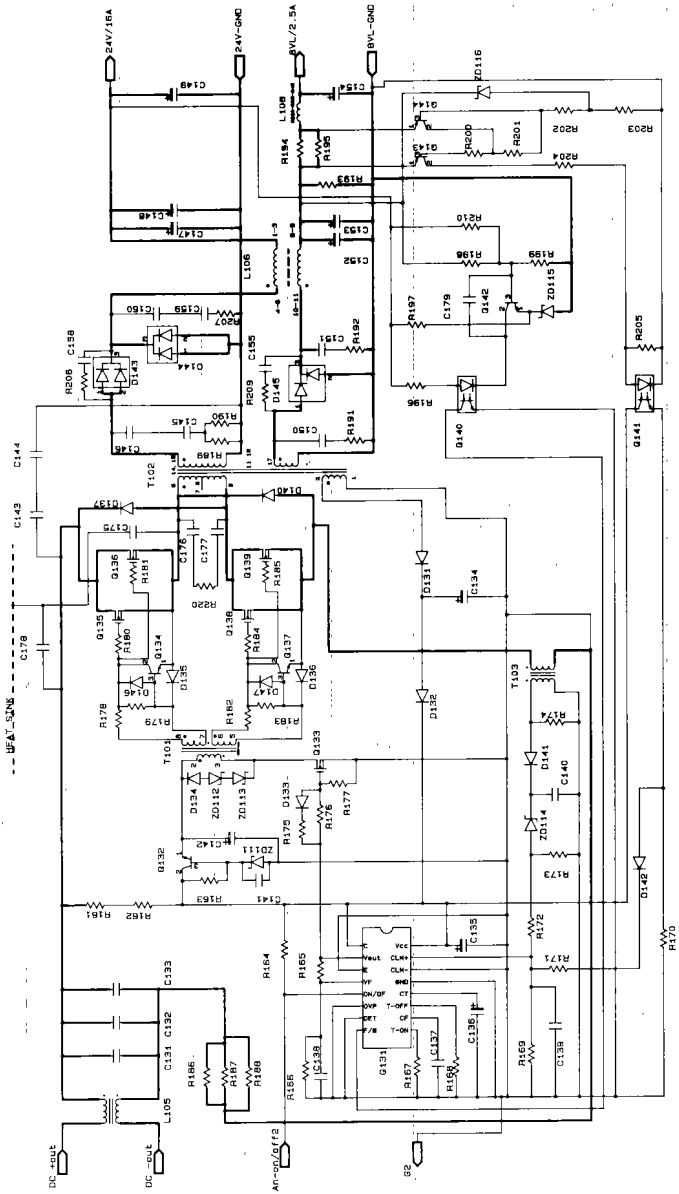
# F. MAIN POWER SUPPLY CIRCUIT DIAGRAM

## Main power supply circuit diagram (1/5)



## Main power supply circuit diagram (2/5)





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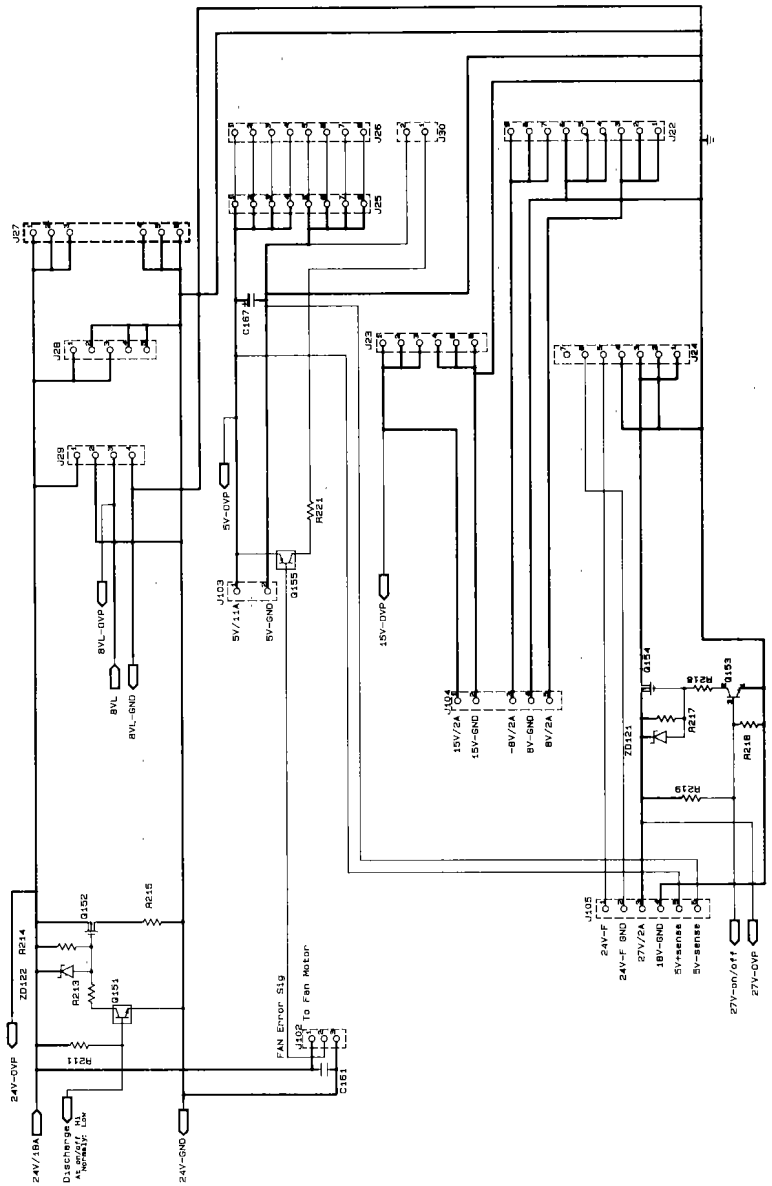
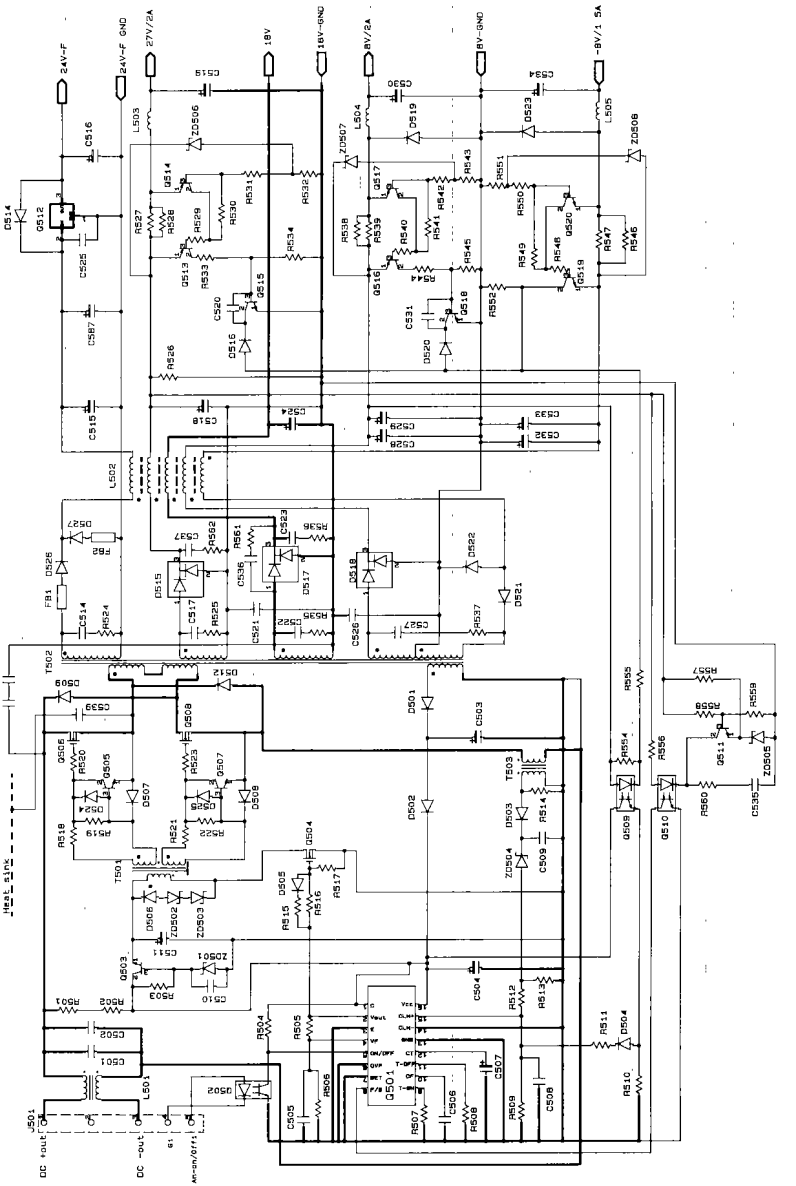
## Main power supply circuit diagram (3/5)



## Main power supply circuit diagram (4/5)





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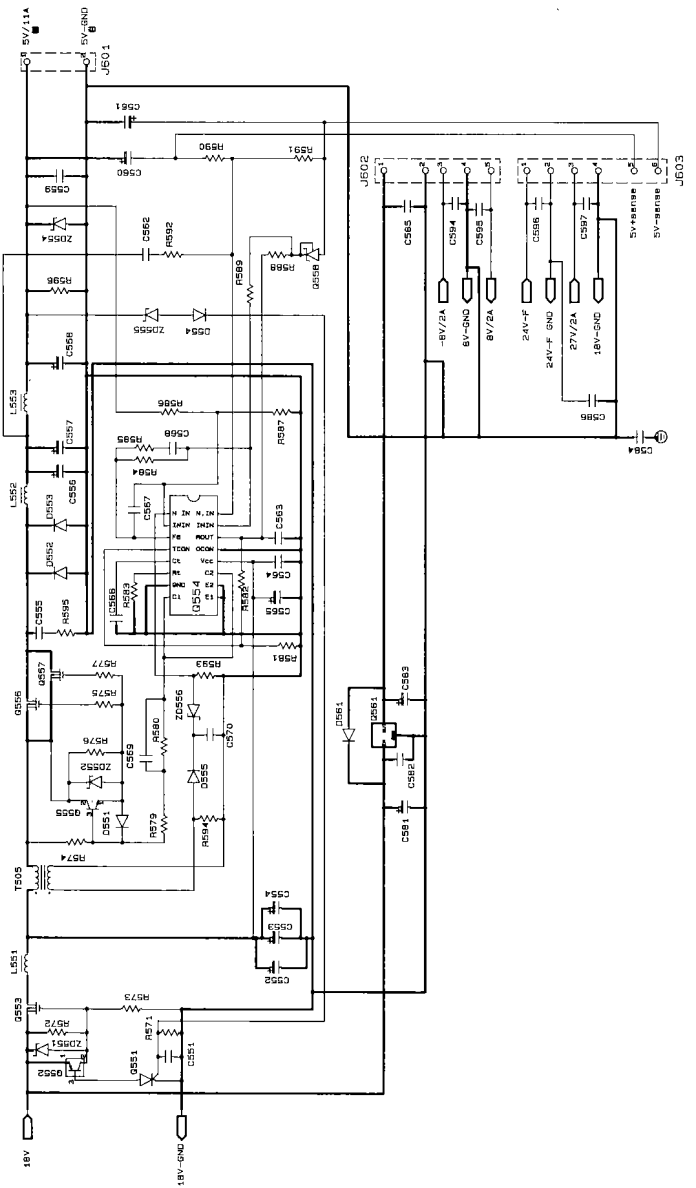
## Main power supply circuit diagram (5/5)

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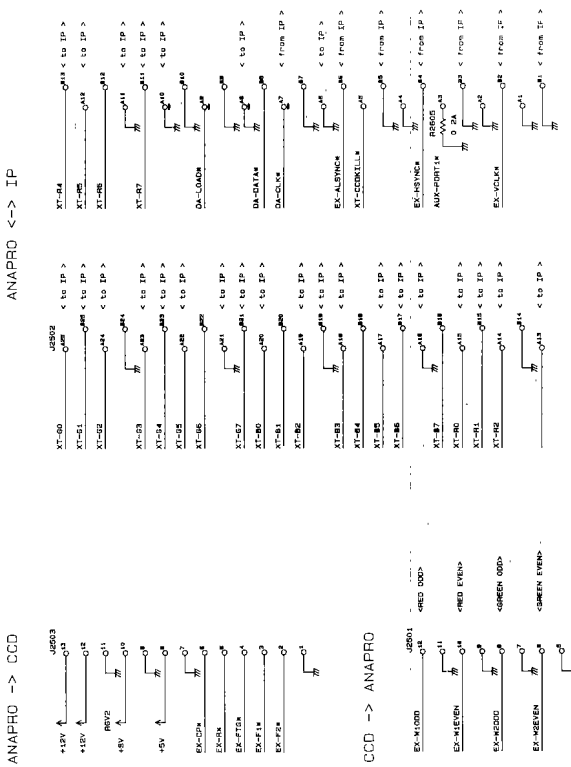
# G. ANALOG PROCESSOR CIRCUIT DIAGRAM

## Analog processor circuit diagram (1/5)





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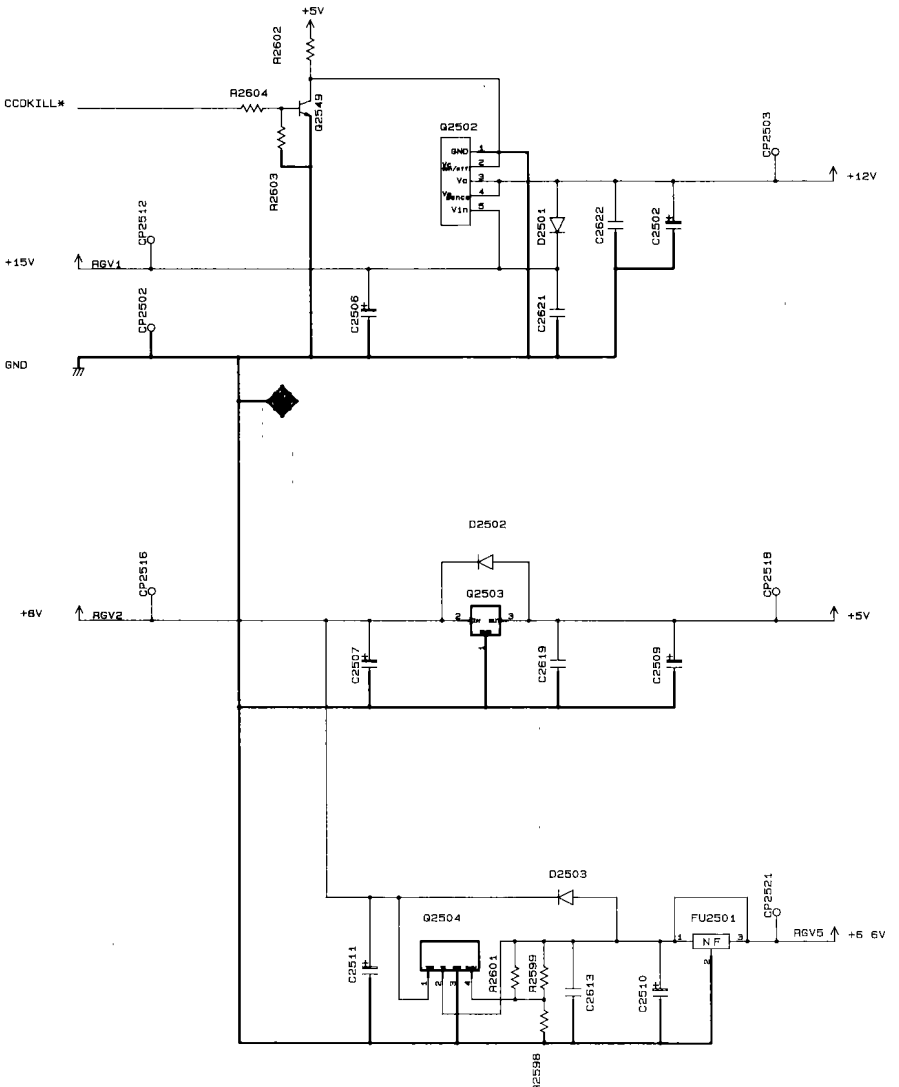
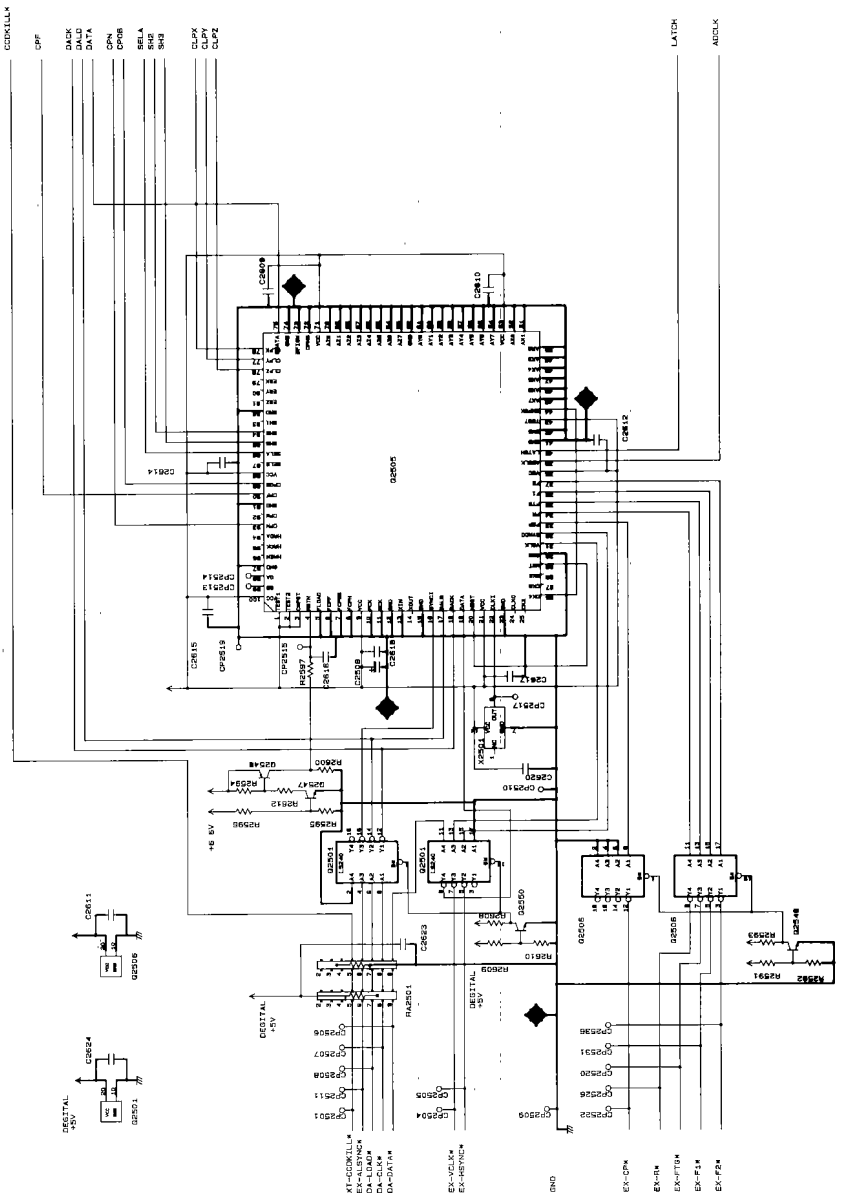
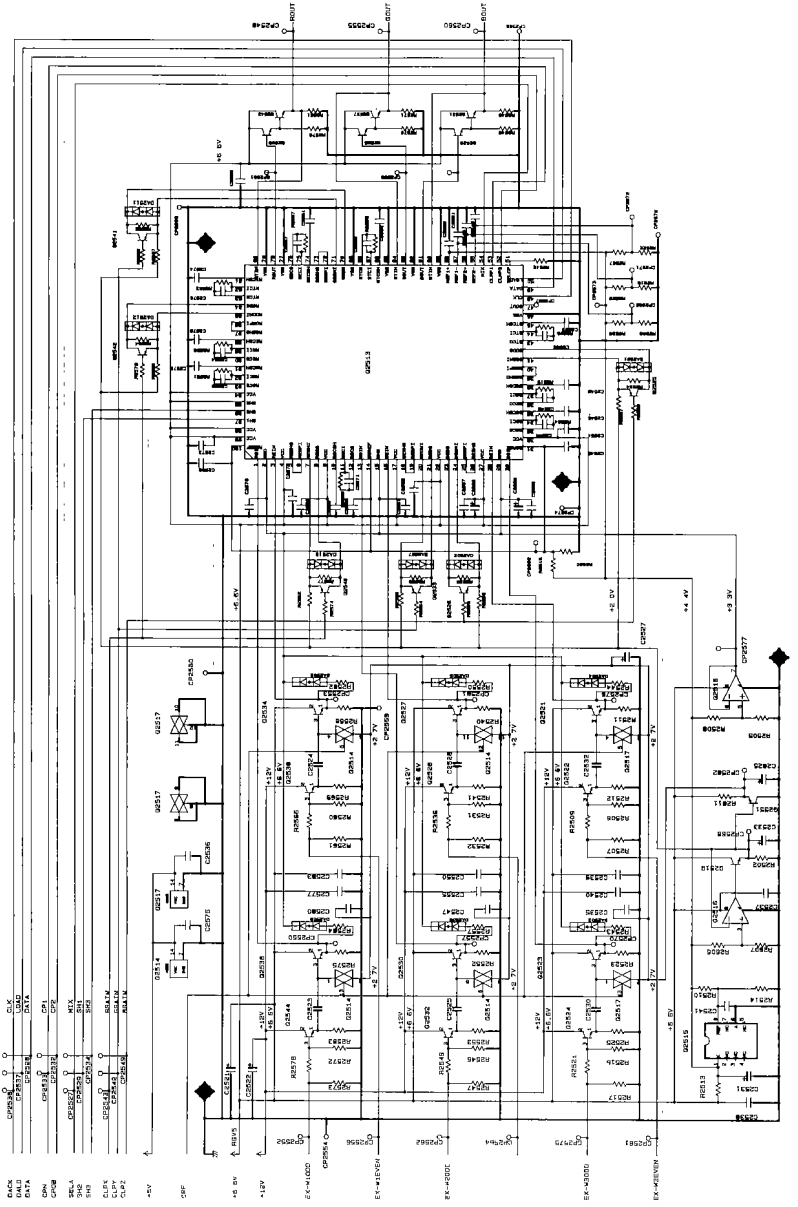
## Analog processor circuit diagram (2/5)



## Analog processor circuit diagram (3/5)



## Analog processor circuit diagram (4/5)



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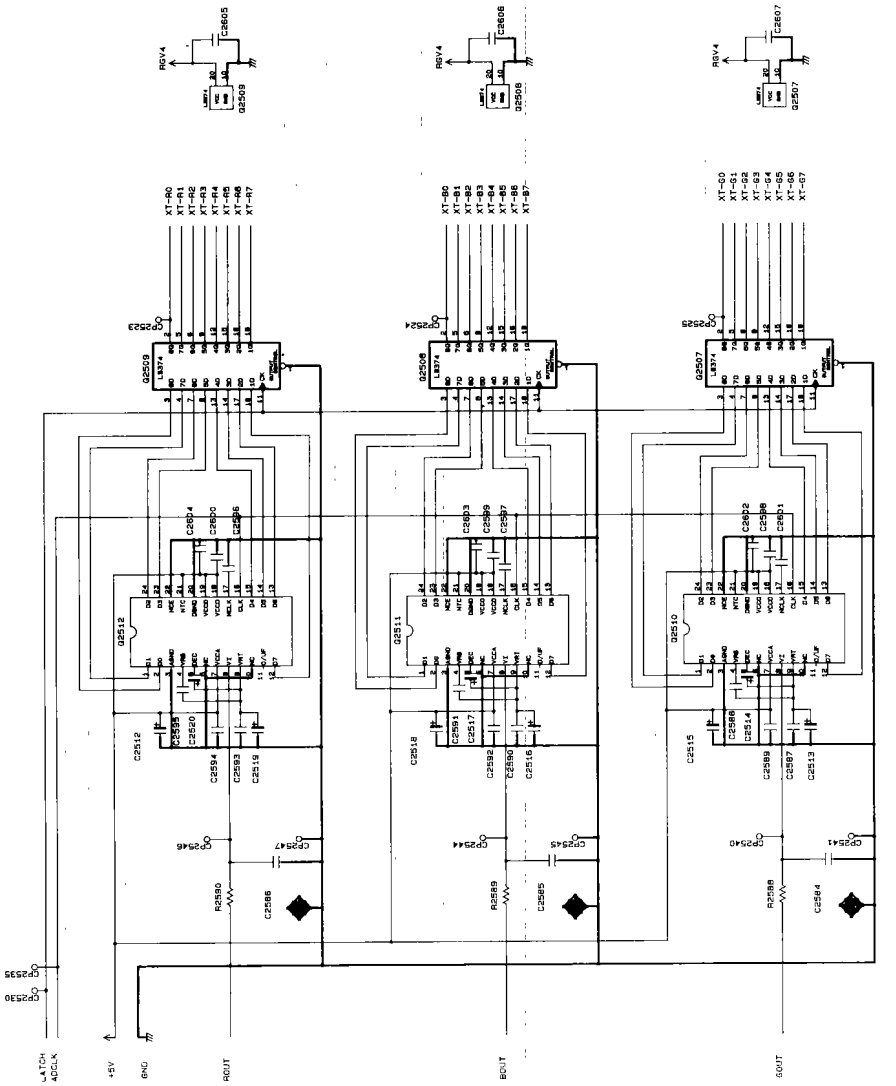
## Analog processor circuit diagram (5/5)

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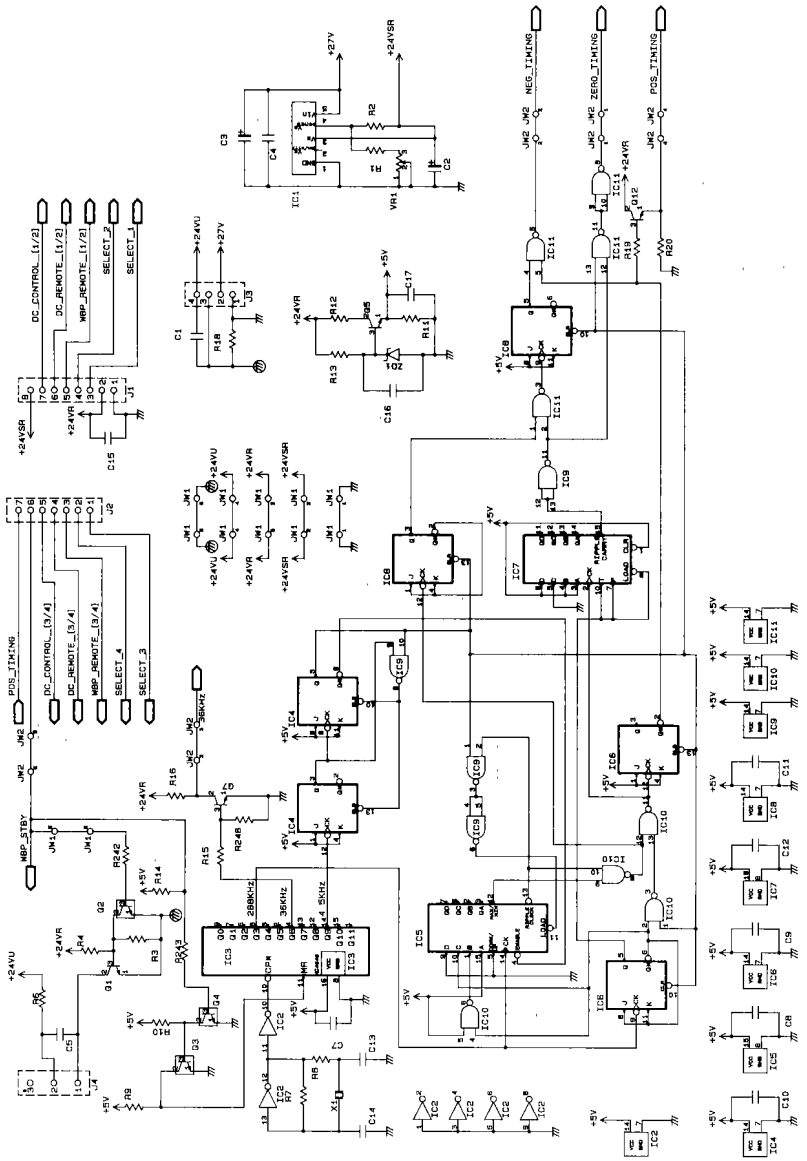
# H. DEVELOPING BIAS CIRCUIT DIAGRAM

## Developing bias circuit diagram (1/6)



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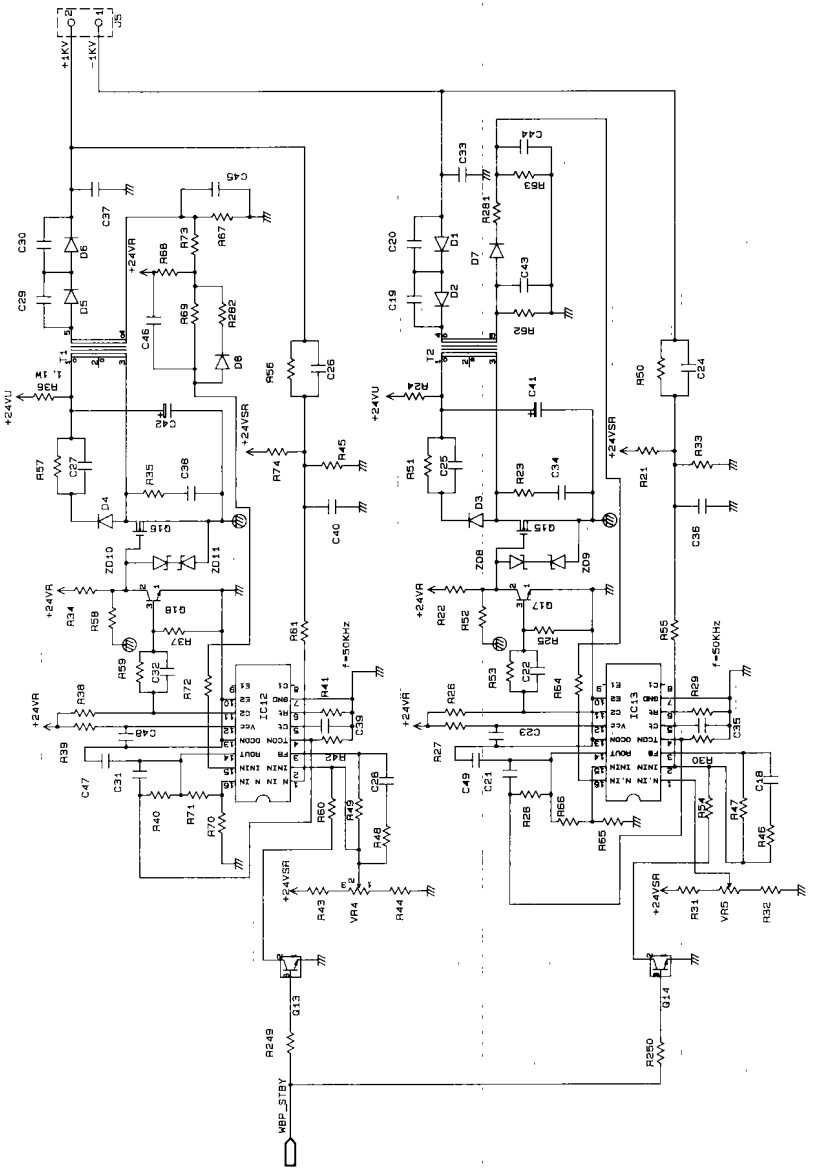
## Developing bias circuit diagram (2/6)





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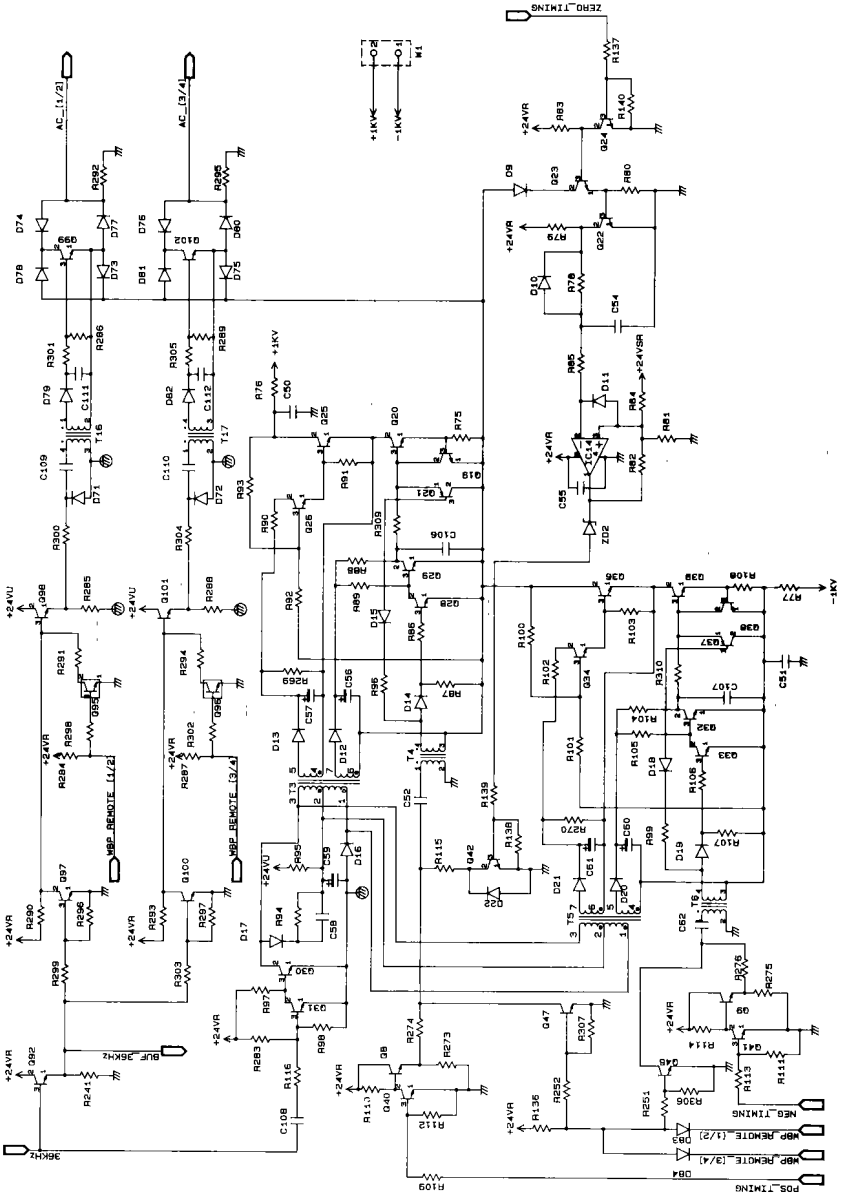
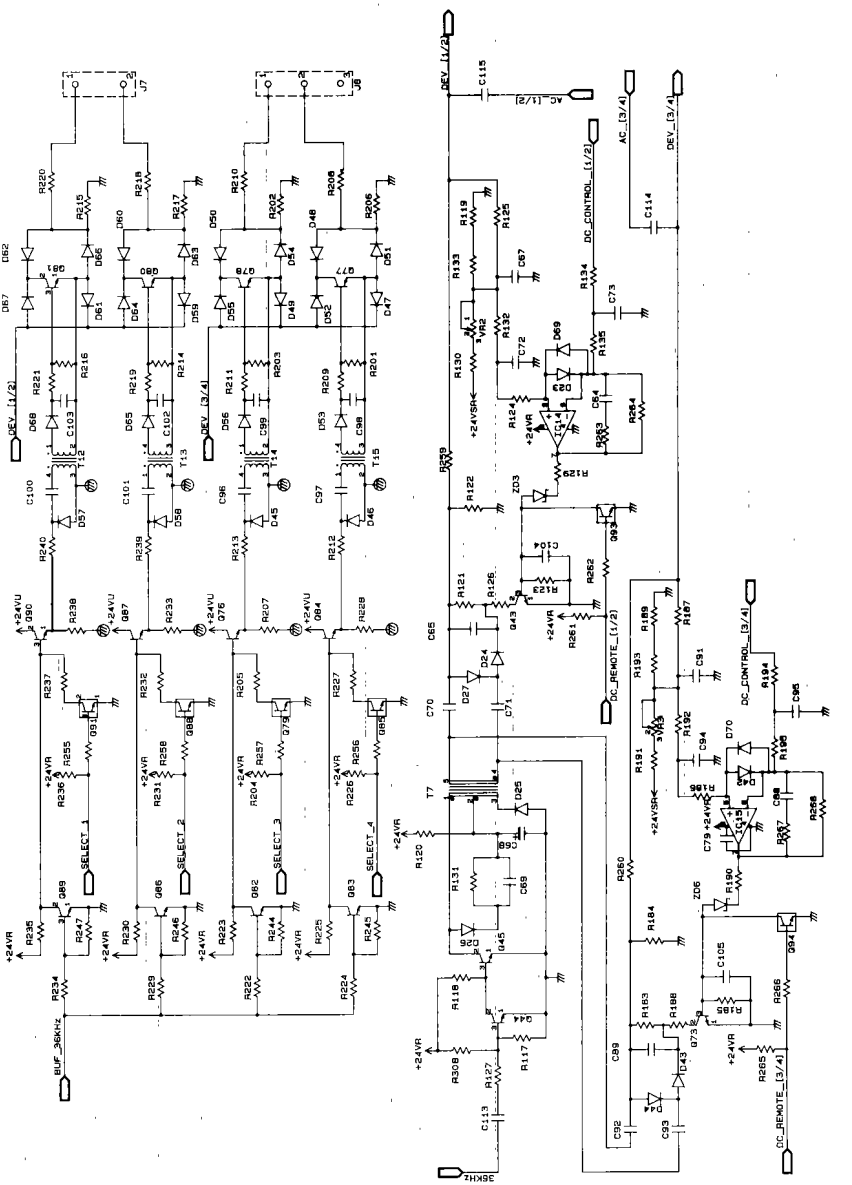
## Developing bias circuit diagram (3/6)



## Developing bias circuit diagram (4/6)

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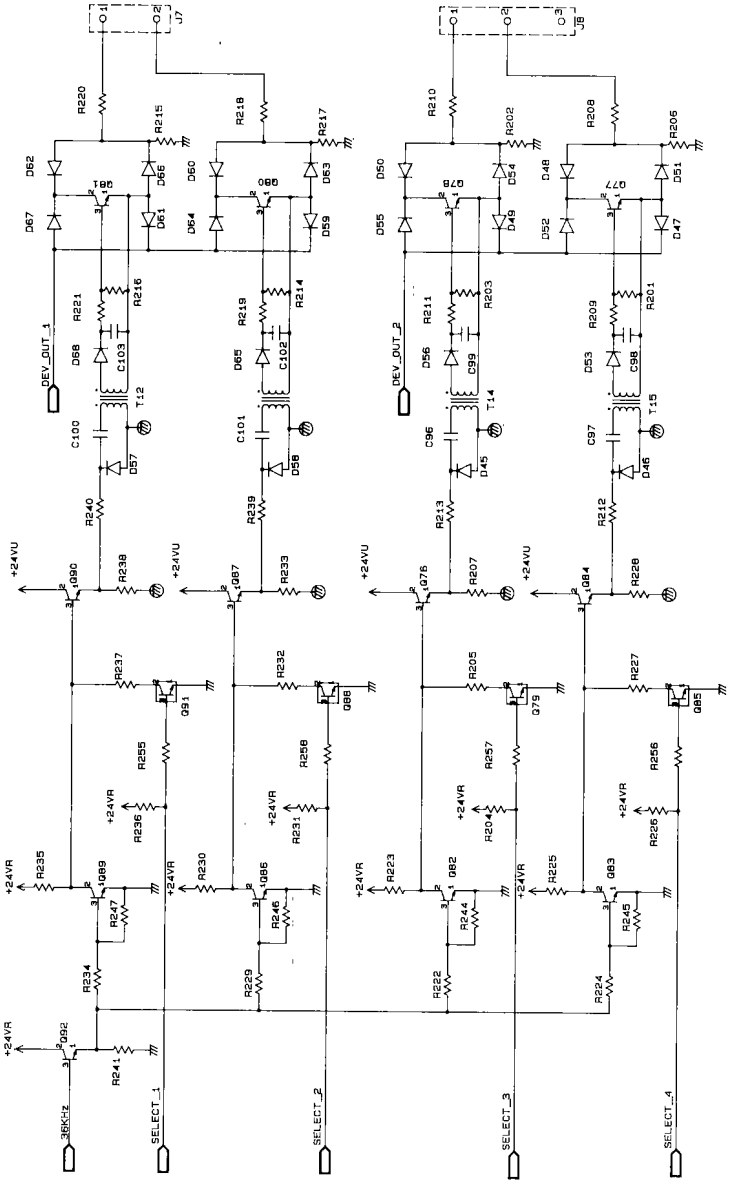
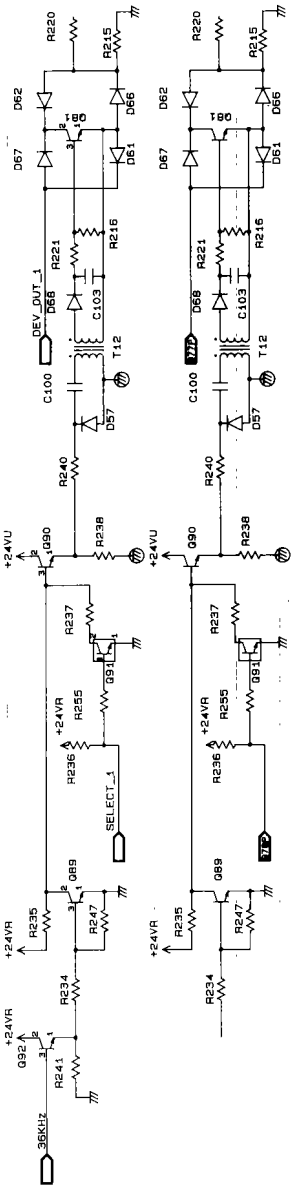
## Developing bias circuit diagram (5/6)



## Developing bias circuit diagram (6/6)





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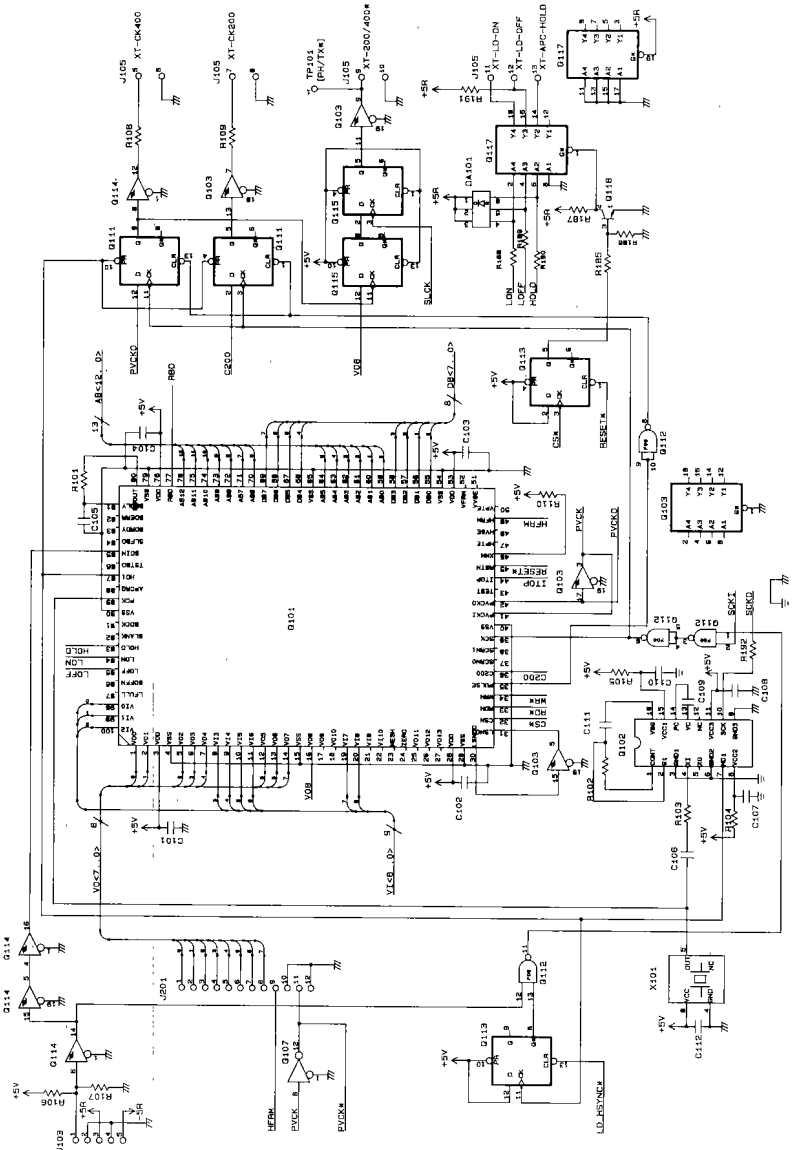
# I. LASER CONTROLLER CIRCUIT DIAGRAM

## Laser controller circuit diagram (1/4)



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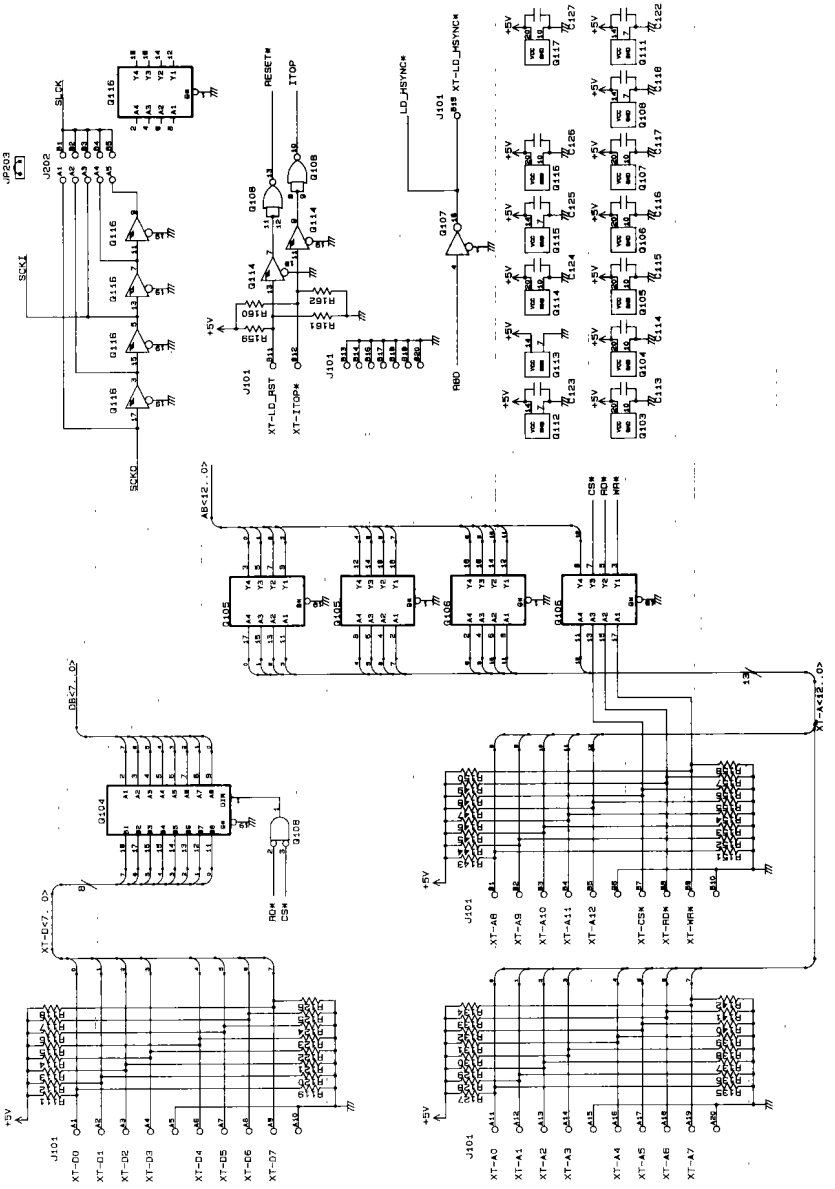
## Laser controller circuit diagram (2/4)

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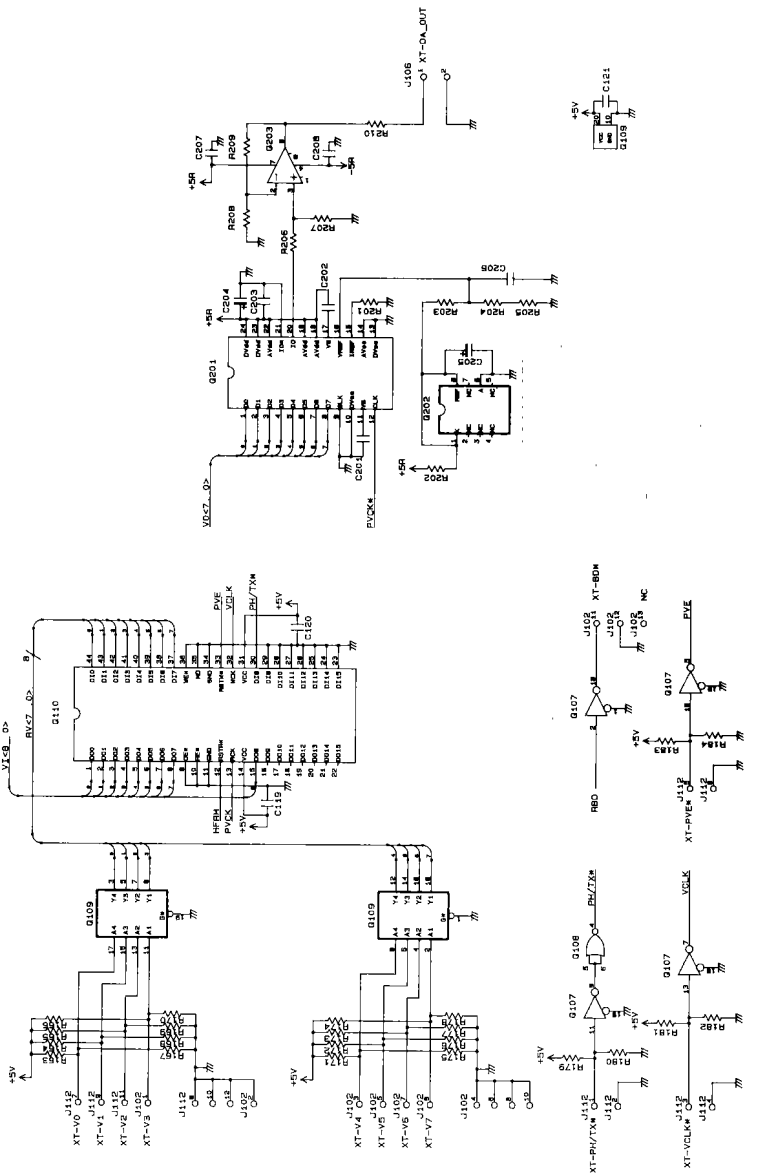
## Laser controller circuit diagram (3/4)



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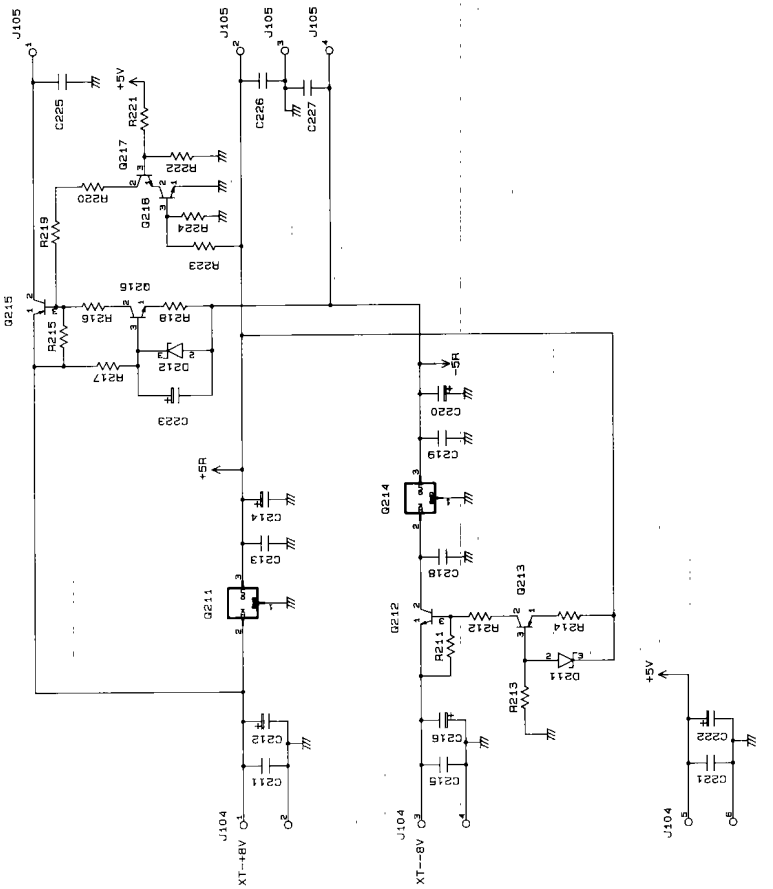
## Laser controller circuit diagram (4/4)





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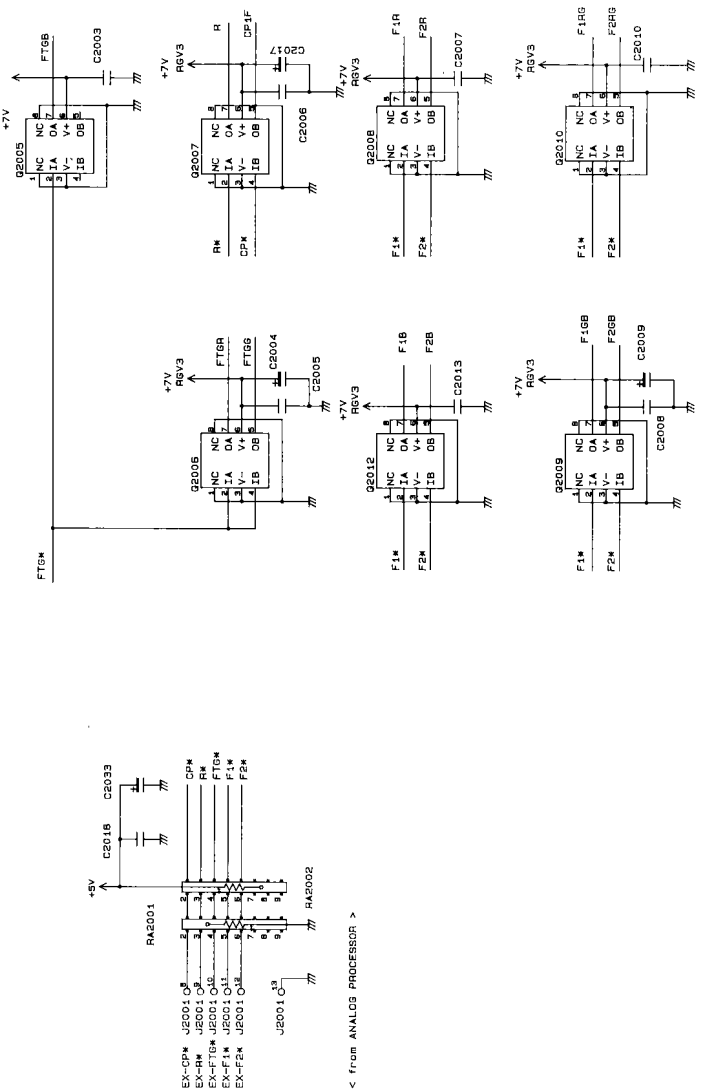
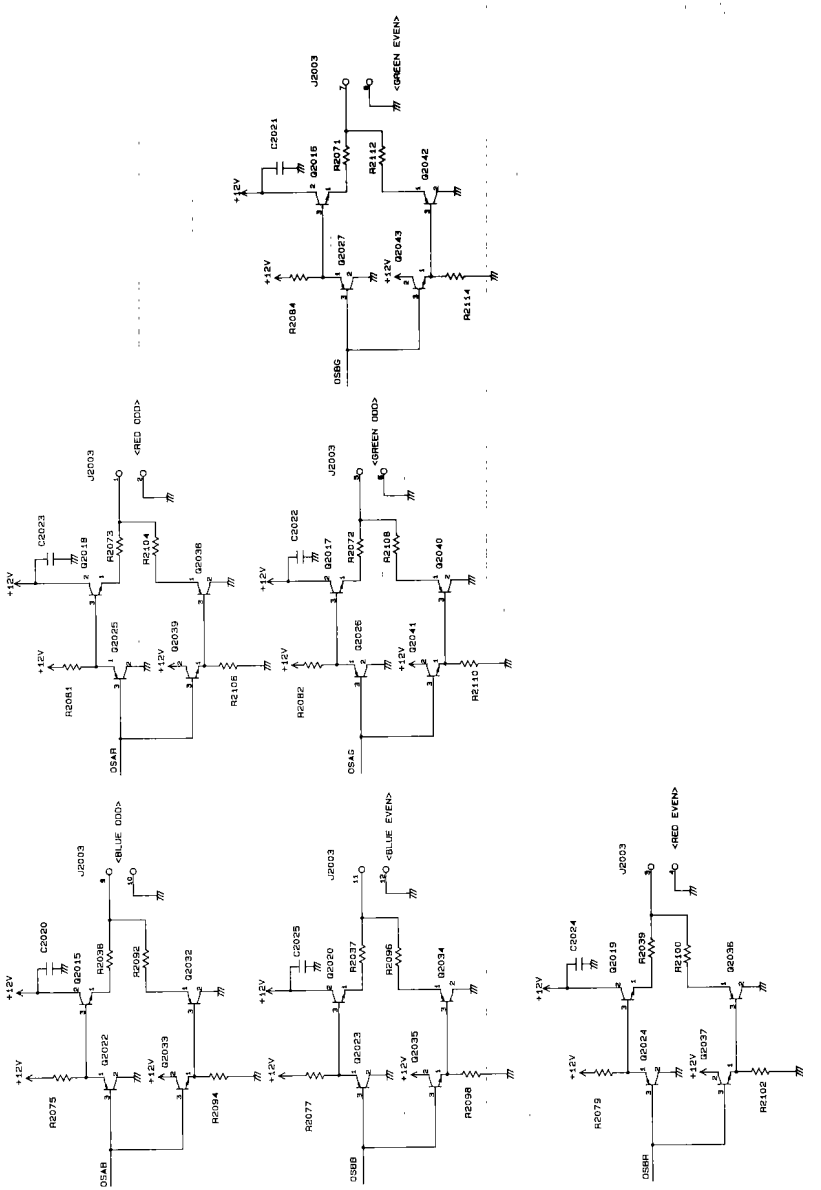
# J. CCD/CCD DRIVER CIRCUIT DIAGRAM

## CCD/CCD driver circuit diagram (1/4)



## CCD/CCD driver circuit diagram (2/4)





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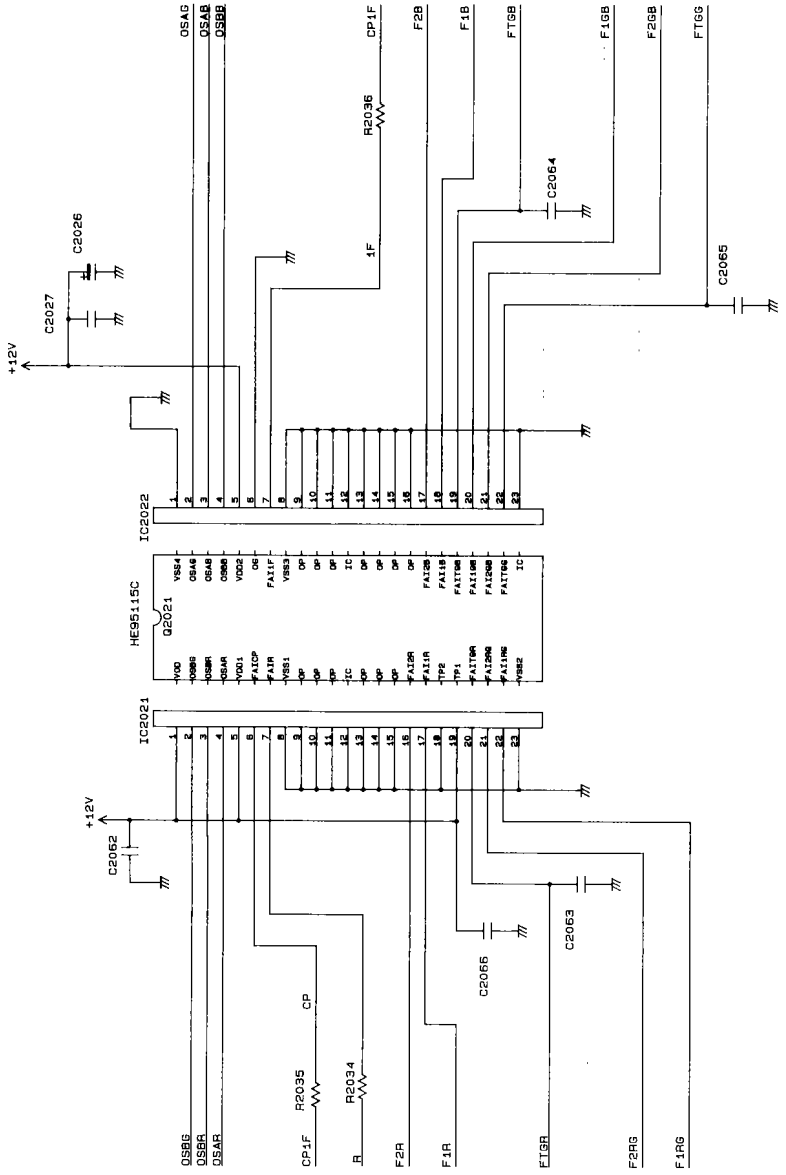
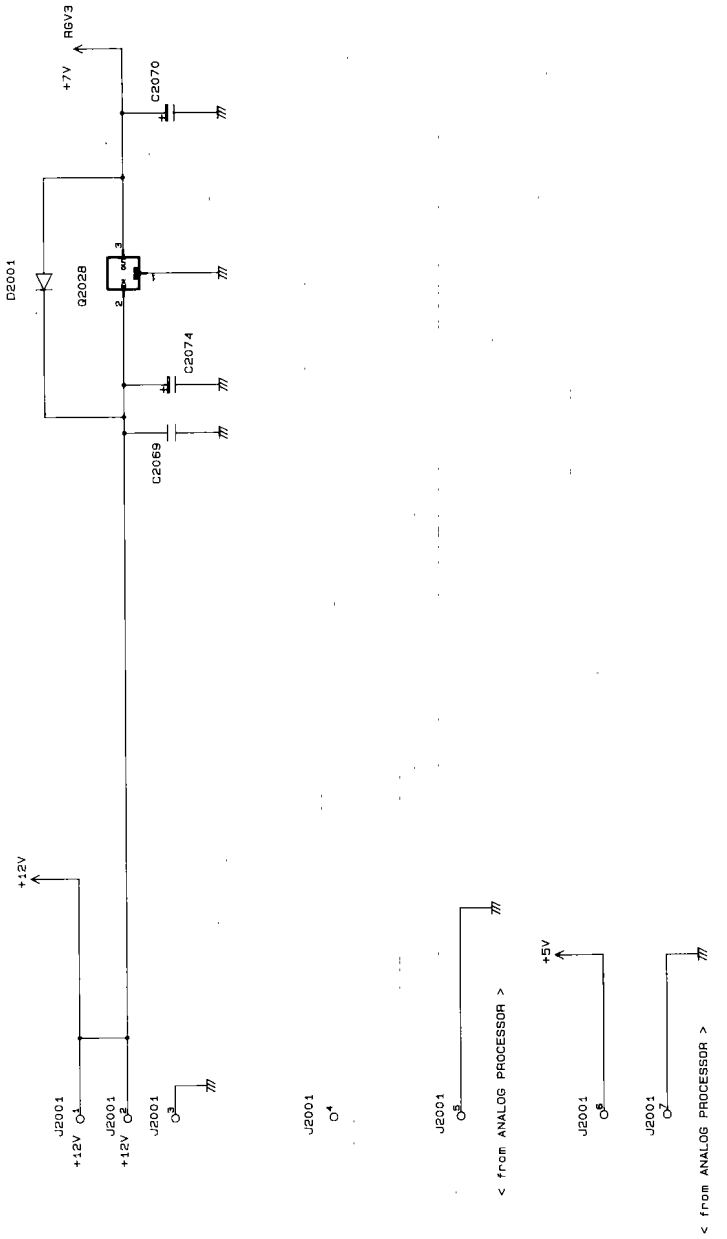
## CCD/CCD driver circuit diagram (3/4)



## CCD/CCD driver circuit diagram (4/4)





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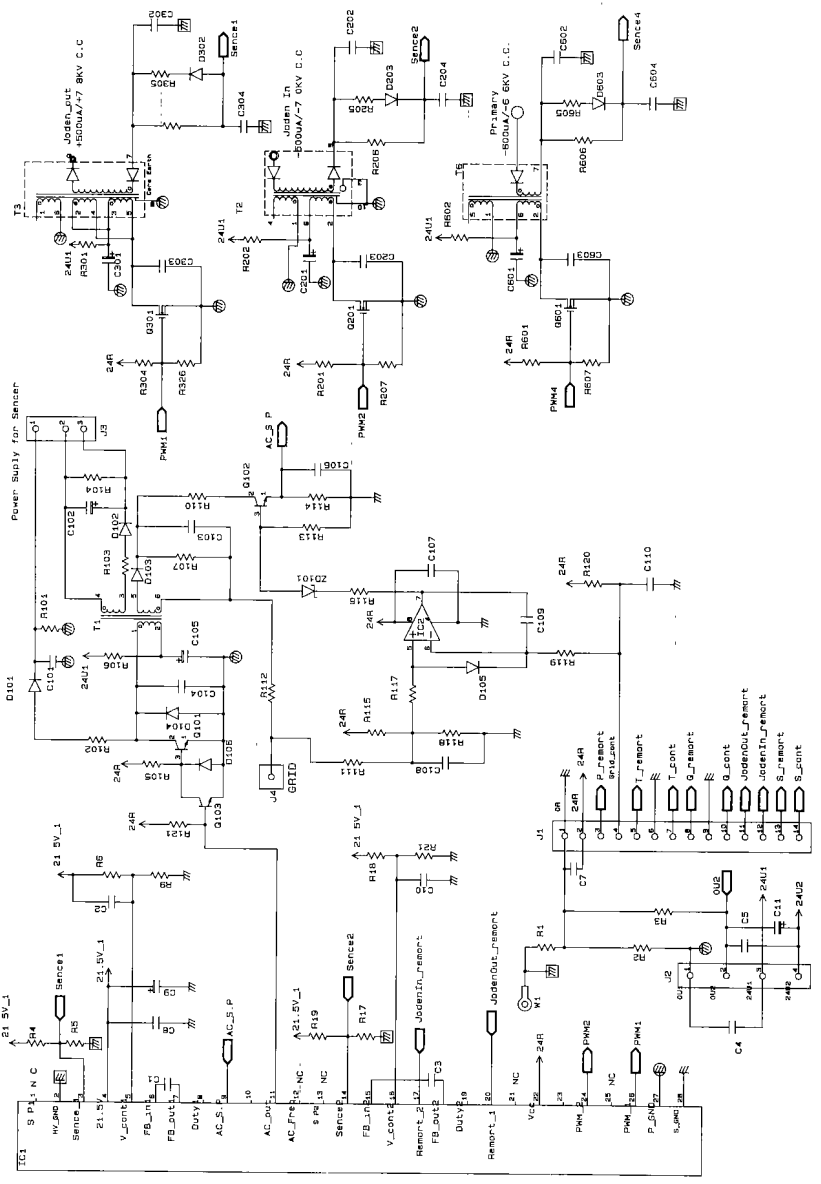
# K. HVT CIRCUIT DIAGRAM

## HVT circuit diagram (1/3)



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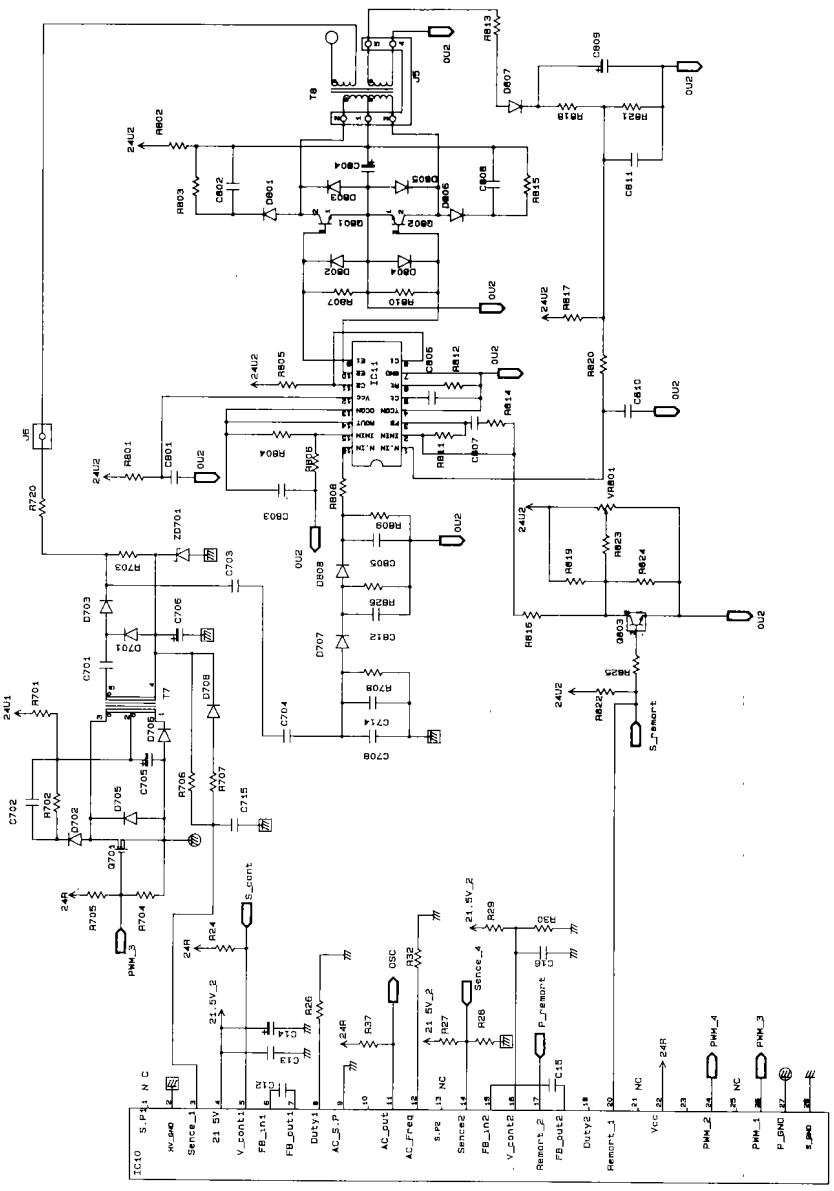
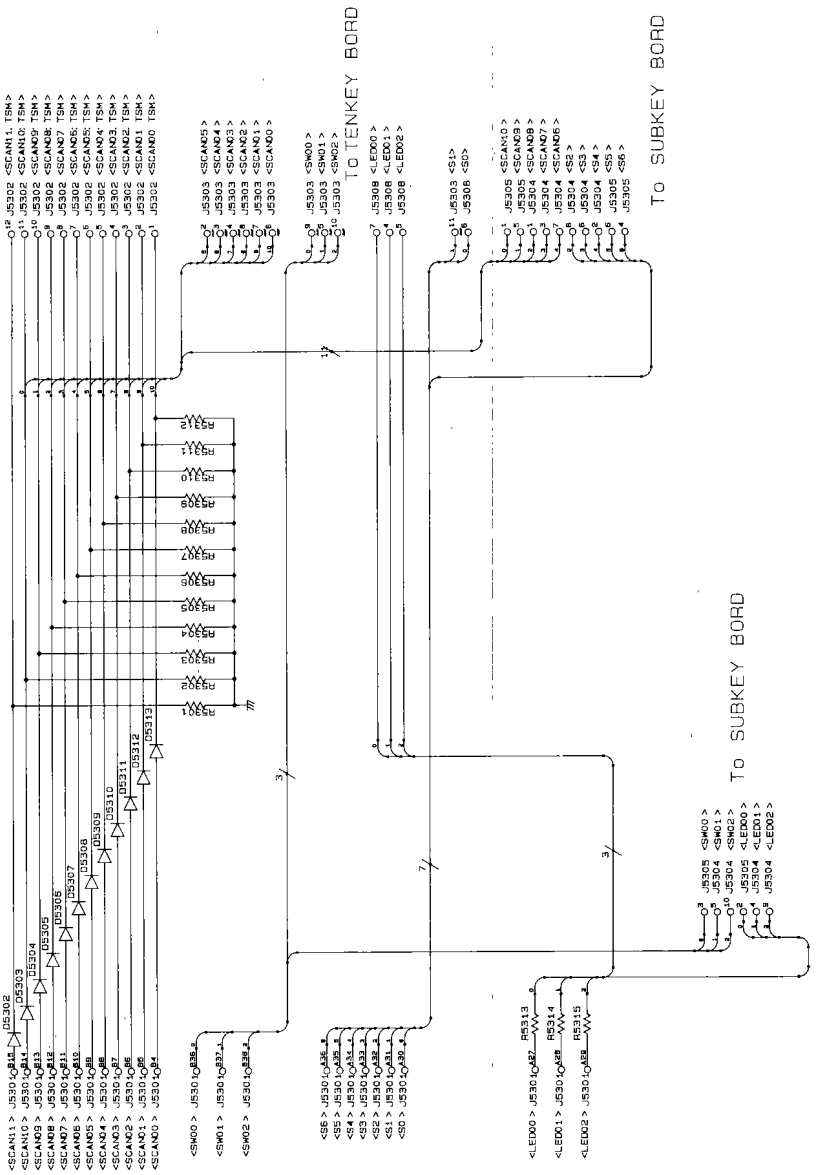
## HVT circuit diagram (3/3)



# L. CONTROL PANEL RELAY CIRCUIT DIAGRAM

## Control panel relay circuit diagram (1/2)





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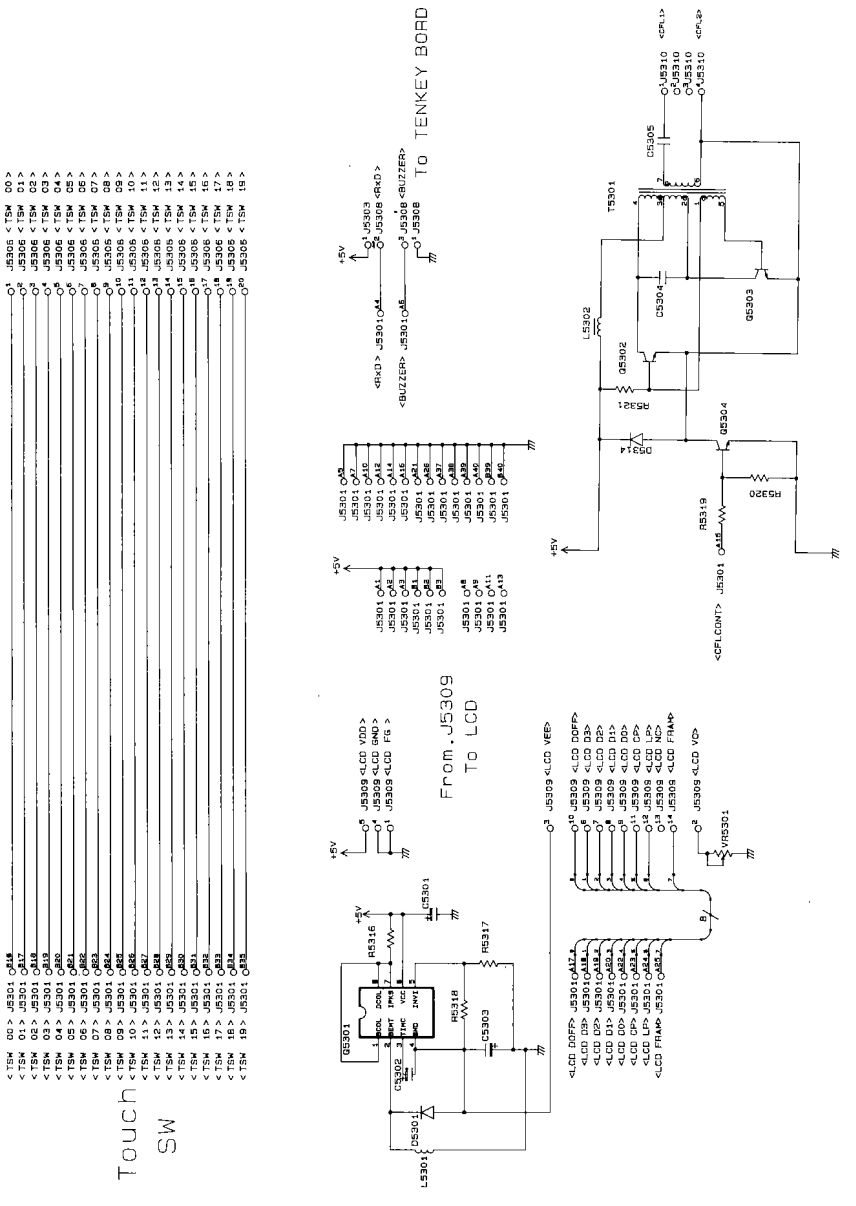
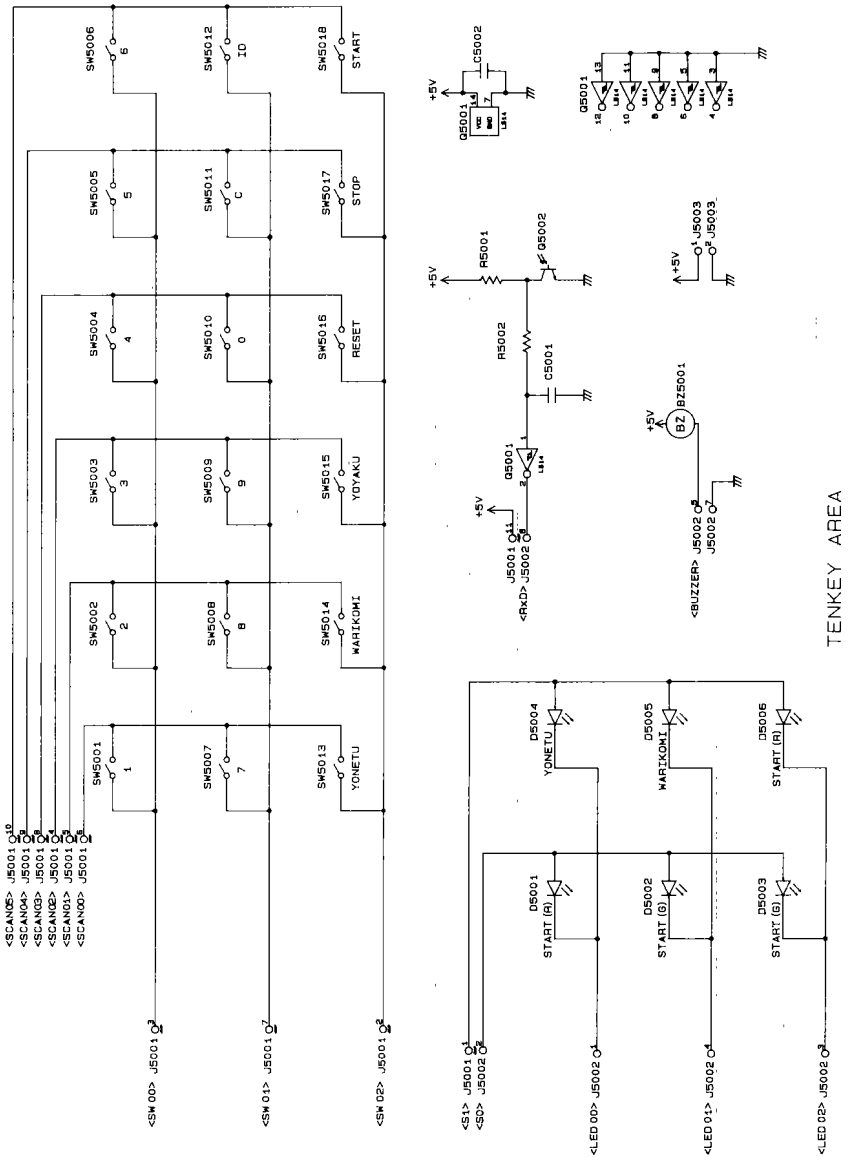
## Control panel relay circuit diagram (2/2)



# M. TENKEY CIRCUIT DIAGRAM

## Tenkey circuit diagram (1/2)





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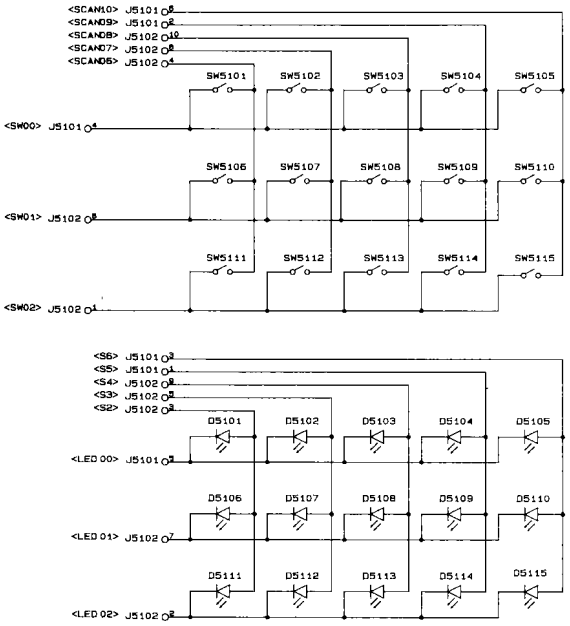
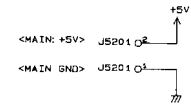
## Tenkey circuit diagram (2/2)



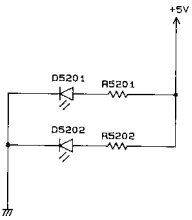




SUBKEY AREA

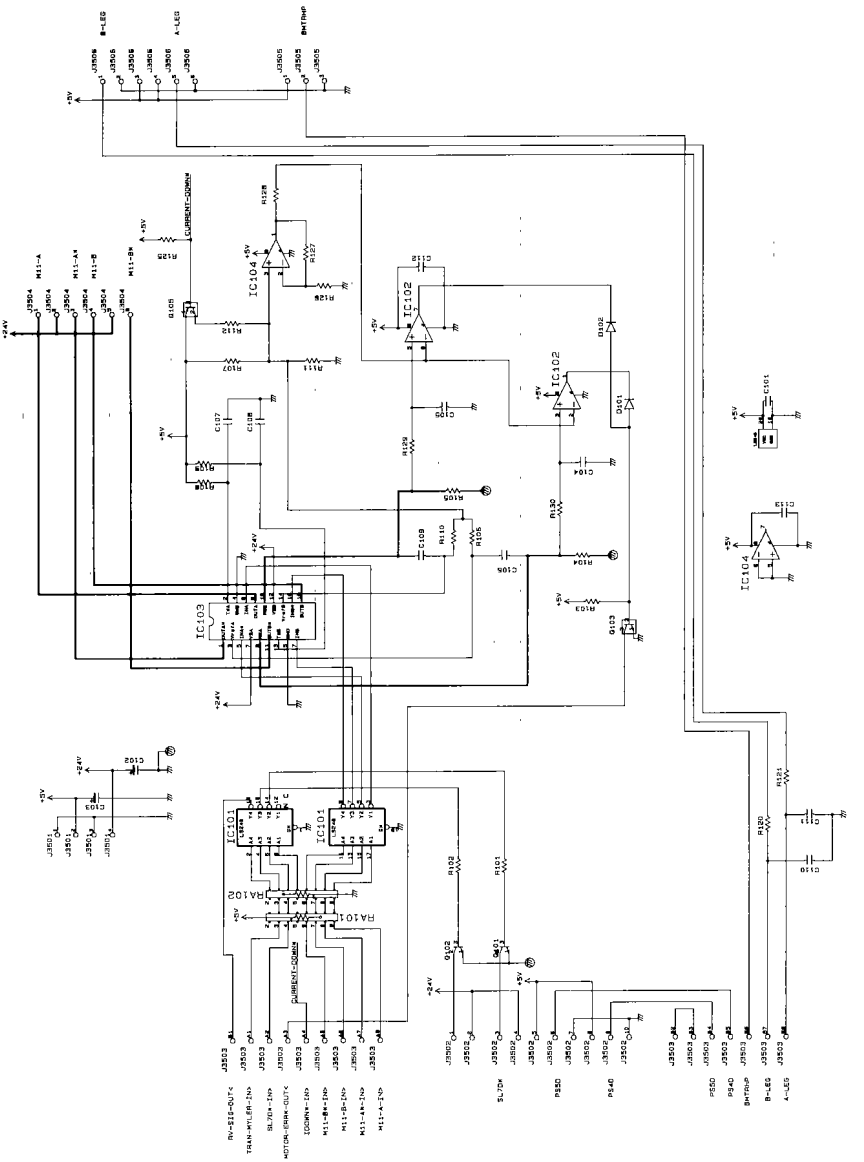



From Ten Key SW Board




PILOT LAMP AREA

# N. TRANSFER DRIVER CIRCUIT DIAGRAM

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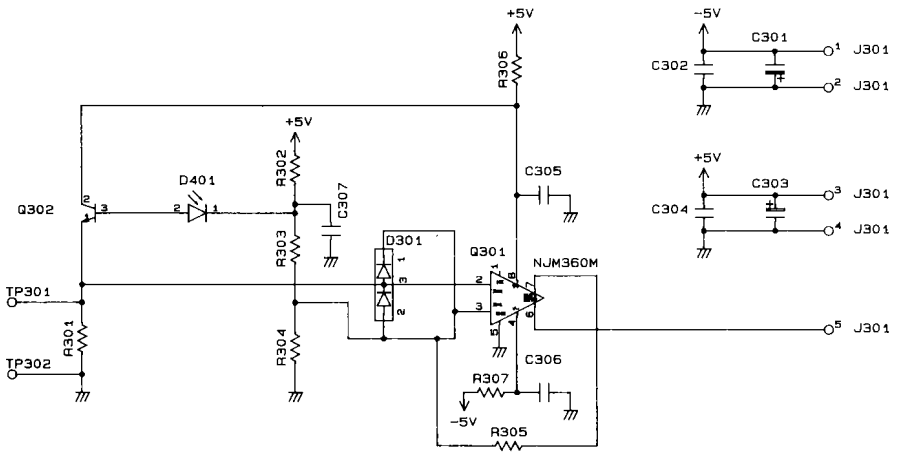
# O. BD CIRCUIT DIAGRAM

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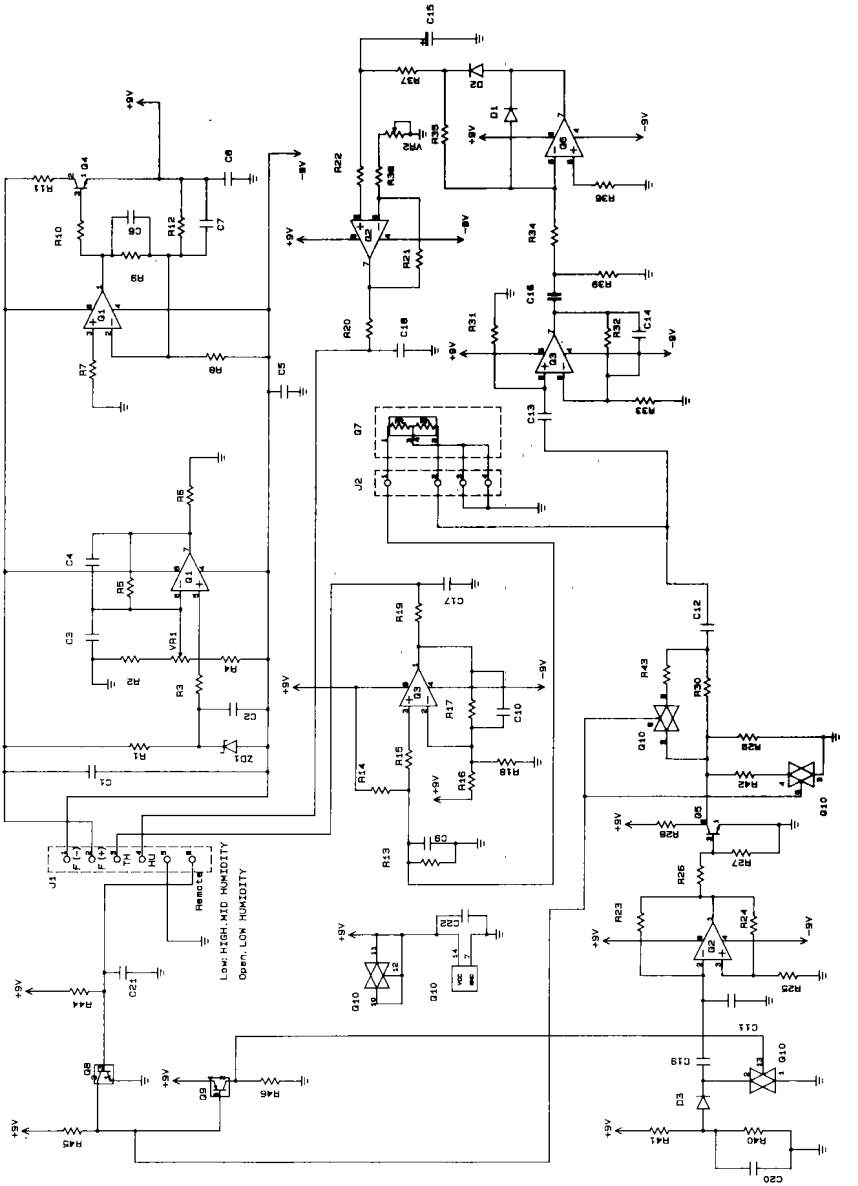
# P. ENVIRONMENT MEASURING CIRCUIT DIAGRAM





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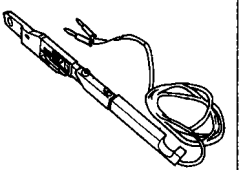
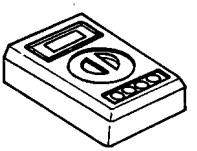
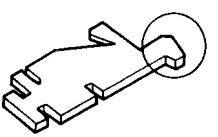
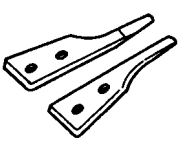
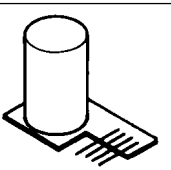
# Q. SPECIAL TOOLS

You will need the following special tools in addition to the standard tools set to service the machine.

| No. | Tool Name | Tool No. | Shape | Rank* | Remarks |
|---|---|---|---|---|---|
| 1 | Laser power checker | FY9-4013 |  | A | Use it when adjusting the intensity of the laser from the laser unit; to be use in combination with a digital multimeter. |
| 2 | Digital multimeter | CK-0436 |  | A | Use it when adjusting the intensity of the laser from the laser unit; to be use in combination with the laser power checker to adjust the intensity of the laser from the laser unit. |
| 3 | Door switch | TKN-0093 | Point to use  | A | Do not remove the transfer assembly frame while the door switch is on. |
| 4 | Stop ring pliers end replacement | CK-0426 |  | B | Use it when removing the grip stop ring; 4 to 9 mm. |
| 5 | Environment sensor checker | TKN-0456 |  | B | Use it when checking the environment sensor. |

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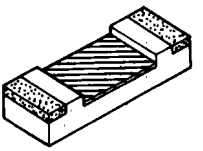
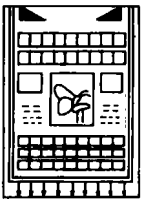
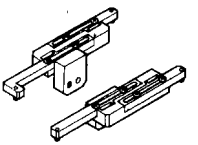
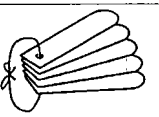
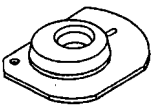
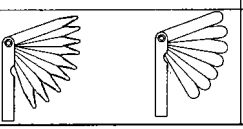
| No. | Tool Name | Tool No. | Shape | Rank | Remarks |
|---|---|---|---|---|---|
| 6 | Environment sensor checker | TKN-0457 | | B | Use it when checking the environment PCB. |
| 7 | Potential sensor checker (terminal) | TKN-0197 |  | B | Use it when making a zero-level check on the surface potential sensor. |
| 8 | CA1 test sheet | FY9-9030-000 |  | A | Use it when adjusting or checking images. |
| 9 | Mirror positioning tool (front, rear) | FY9-3002-000 |  | B | Use it when adjusting the position of No. 1/No. 2 mirrors; to be used in combination with the mirror positioning tool (rear). |
| 10 | S-B gap gage | FY9-3015-000 |  | B | Use it for adjusting the S-B gap of the developing assembly. |
| 11 | Positioning tool, photo, drum shaft | FY9-3016-000 |  | B | Use it for adjusting the position of the shaft of the photosensitive drum. |
| 12 | Gap gauge | CK-0057-000 or CK-0061-000 |  | B | Use it to adjust the transfer separation claw position. |

*Rank

A : Must be kept by each service person.

B : Must be kept by each group of about five service persona.

C : Must be kept by each workshop.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# R. SOLVENTS AND OILS LIST

| No. | Item | Use | Chemical formula, mixture ratio, etc. | Source | Remarks |
|---|---|---|---|---|---|
| 1. | Ethyl alcohol (Ethanol)<br><br>Isopropyl alcohol (Isopropanol) | Cleaning: copyboard, glass, mirror, etc. | $C_2H_5OH$<br><br>$(CH_3)_2CHOH$ | Local | Take care in handling. All are flammable.<br><br>Use in a well-ventilated area. Avoid breathing vapor. |
| 2. | MEK | Removing toner or oil stains | $CH_3$-CO-$C_2H_5$ Methylethy ketone | Local | Do not use for cleaning the drum, plastic molded parts, or corona wires. Use in a well-ventilated area and avoid breathing vapor. Avoid contact with eyes or with skin. |
| 3. | Hear-resistant grease | Lubricating the drive mechanisms; e.g., fixing drive gear, fixing ass'y, etc. | | CANON | Tool No.: CK-0427 (500 g/can; equivalent grease may be used if able to withstand 200°C for extended periods of time.) |
| 4. | Lubricating oil | Lubrication points | ISO VG 68 oil<br>ESSO Feibs K68<br>MOBIL Vactra oil No. 2 SHELL Tonna oil T68 | Local | Equivalent oil can be used. Tool No.: CK-0451 (100 cc) |
| 5. | Lubricant | | Mineral oil (paraffin family) | Local | • Uniway 220 (Nihon Sekiyu)<br>• Tool No.: CK-0524 (100 cc)<br>• Alternative Cosmo Dynaway 220 (Cosmo Oil) |
| 6. | Flannel cotton cloth | Cleaning | | Local | It should be soft enough for cleaning the drum, and it should not produce lint. |
| 7. | Lint-free paper | Cleaning | Kimberly-Clark Kim wipes 6020-23 × 40 cm, or 6021-13 × 21 cm | Local | It should be soft enough for cleaning the drum, and it should not produce lint. |

**Note:**
Solvents listed are not toxic, but they may produce minor, temporary effects if breathed in a high concentration, or if let to remain on the skin for a period of time. Any effects are temporary, but exercise reasonable caution nevertheless.

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